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Revenge**

*Programs for the BBC, ZX81, Spectrum,
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40 Space/time adventures in fast moving graphics 48K

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With Speech and programmable 48K

Author: Martin Whitt-Hilton

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With speech and Hi Res Graphics. 16K or 48K

Author: John Hollis

SPACE INTRUDERS

With music and Hi Res Graphics. 16K or 48K

Author: John Hollis

EASYSPEAK

Add speech or music to your programme. 48K

Author: John Hollis

MINED-OUT

With 6 levels of minefield. 48K

Author: Ian Andrew

SOFTWARE FOR THE ZX81 WITH 16K RAM

QS ASTEROIDS

...very good...
...addictive game!
(C & VG1)

Author: John Hollis

QS DEFENDA

...better than any other arcade game I've seen.
(Clyde)

Author: Nick Lambert

QS SCRAMBLE

amazing, fantastic!
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Author: Dave Edwards

QS INVADERS

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(C & VG1)

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MINED-OUT

With 6 levels of minefield. 48K

Author: John Field

THE CHESS PLAYER

With speech and programmable 48K

Author: Martin Whitt-Hilton

METEOR STORM

With speech and Hi Res Graphics. 16K or 48K

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Author: A. Morgan

ZX81 with 16K RAM

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Author: C. K. Tams

ZX81 with 16K RAM

30 BLACK STAR

Arcade action

Features: Fast, furious 8K graphics, fast scoring, four types of target. Eight instrument displays, wind drive, resuming alien, time limit, 17 levels of progressive difficulty, high score table

Author: M. Sudworth

ZX81 with 16K RAM

DAMPER & GLOOPER

Arcade action

Features: Fast action, 5 lamps increase to 8 on later phases, 3 lives plus bonus lives, ever increasing speed, high score table frame features, sound clear at end of games, bonus phase worth 8000 pts, high score save and display.

Author: R. Crane

ZX81 with 16K RAM

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Features: 20 levels of play "Mind Game" plus shooting rifle, speed limit, all ways and measured against the players personal ever-higher score.

The game is based on historical data

Author: Marion Stubbs

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WARNING: These programs are sold according to QUICKSILVA Ltd terms of sale and conditions of sale. Copies which are available on request

News & Reviews

GAMES NEWS 16

Join in the Dark Crystal adventure take part in a duel at midnight and reel back in horror at Thorn EMI's latest arcade sea monster.

VIDEO SCREENS 20

Turn your VCS into a home computer Phoenix versus Demon Attack, we make our choice. And two brand new games manufacturers exclusively revealed in these pages.

ARCADE ACTION 30

Three ways to notch up extra points in Pengo. Take a fight back into the past with Time Pilot and take Popeye through his spinach munching adventures.

REVIEWS 96

Alan Delander is taken through his paces and compared to the arcade original. We also give language a Schools a test run on the Spectrum.

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FORMULA ONE

Take to the test track in your turbocharged Atom and race away from the opposition in this all-action fast and furious four-wheeled fun-packed game.

SKI-ING

Experience all the ups and downs of alpine skiing — but without suffering the bruises and broken bones. Winter sports for all you Texas T98/4 owners.

NUMBER PATCH

Have you got an appetite for numbers? Then this is the game for you. All you need is a snake and a Pet — or maybe a pet snake?



DDDGEMS

Take up the challenge of a time-trial in your sleek black ZX81. Can you set the fastest time? Watch out for the oil slicks!

DOCTOR VIC

This is our contribution to the National Health. You've read all those newspaper stories saying how computer games can make you ill — well this one tells you just how ill you are! For medical students with a Vic-20.

TANK BATTLE

Sherman, Tiger, Panther, Churchill — everyone's playing tank battle! Wargames go with bang on the BBC model B.

MAD MAX

Motorway madness takes on a whole new meaning with this character in control. 100 mph action all the way on your Sharp.

GRDW WRDM

This one wrangled it's way out of our Alan 400/800 the other day and we've been trying to get rid of it ever since.

CANYON LANDER

What no space games this issue? Of course there's one! Out on a lost planet you are exploring a deep cavern. Cosmic challenge on the Spectrum.

GHOST'S REVENGE

Watch out Pacman! The ghosts are on the loose and after you — and there are no more energy pills left! Fun for your Dragon.



Crystal clear...

So you want to get a head? Well there's a chance for everyone to win one on page 24 where we set out our Dark Crystal computer competition.

The competition invites you to show your creativity on a computer screen and map out a picture based on the movie.

There's a real chance to take advantage of your programming expertise and make your name on television, by entering the BBC's very own young programmer competition.

The details are being outlined on the Get Set series on Saturday April 16th, or they can also be found on page five of this issue.

And the third competition to be associated with this magazine is an Trevor Turrans' Pussies column where Milton Bradley have put up three of their arcade theme board games as prizes.



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COMPUTER AND VIDEO GAMES PORTAL SUBSCRIPTION SERVICE. By using the special Portal Subscription Service, copies of COMPUTER AND VIDEO GAMES can be mailed direct from our offices each month to any address throughout the world. All subscription applications should be sent to the COMPUTER AND VIDEO GAMES (Subscription Department), Competition House, Farnham Road, Market Harborough, Leicestershire. All orders should include the appropriate remittance must payable to COMPUTER AND VIDEO GAMES. Annual subscription issue (12 issues) £5 and £10.00 Overseas postage mail £11.00. Actual Europe £20.00. Additional service information including printed, overseas airmail rates available upon request. Classification Department: EMAP National Publications. Published and distributed by EMAP National Publications Ltd. Printed by Eddi Fisher (Southdown) Limited.

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ames

'Ere! What's your GAME?

Turn your programs into gold – with Virgin Games, a new computer software company, part of the Virgin Group and backed by all its resources. Our expertise is in marketing, merchandising and sales – in fact in all the aspects of turning software into cash.

So, we are searching for exciting, entertaining and original programs (from software houses or individual programmers) for the following home computers – Atari, BBC, Commodore 64 and VIC 20, Dragon, Oric 1, Sinclair ZX Spectrum and Texas Instruments 99/4A.

If you have written a games program with good graphics, lots of action and an original concept and you want to be rich and famous – but you don't have the resources to market it properly yourself – send a cassette copy to **Nick Alexander, Virgin Games, 61/63 Portobello Road, London W11**. We will evaluate it and if we believe that it has good commercial potential, we will offer you a contract for it.

We are also forming a team of first-class free-lance machine code programmers. If you are interested drop us a line with an example of your work.

When sending us programs to evaluate, make sure that you enclose your name, full address and phone number, operating instructions and details of the computer it runs on. Make sure you keep a copy of the program yourself.

We will only be taking on a limited number of programs so don't delay!

● Virgin Games Ltd, 61/63 Portobello Road, London W11 ● Tel 01-221 7535.



NEXT

Dare you look inside our little black box? It will be waiting to reveal all its mysteries within the pages of the next issue of *Computer and Video Games*. We also challenge you to find the promised land in our epic version of The Ten Commandments.

If that's too heavy for you then how about a day at Royal Ascot.

Home video gaming has really taken off in the U.S. and that craze is surging across the Atlantic.

Two exciting new machines, the Colovision and the Vectrex will be in our shops by June with the long-awaited Atari 5200 following later.

Eugene Lacey has been keeping you up to date with developments in Video Screens, but in June we are adding a 30 page supplement featuring: reviews, interviews, news of the coming software, full colour pictures of the games on screen and a special competition for three video gamers to win five games cartridges of their choice.

When we've tackled Colovision's own Zaxxon robot, even home computer gamers will take note.

LOOKING FOR SCREEN GEMS

Tune-in to the BBC's Get Set on Saturday April 16th and you will be invited to prove your programming talent.

Those of you who spotted Terry Pratt on the first Get Set on April 2nd will have another chance to see your favourite editor setting out the rules of a competition to find Britain's top young programmer.

If you have developed an original program for your personal microcomputer you should send it in as an entry for the Get Set Computer Program Competition.

All entries must be submitted on a cassette — save the program twice to help avoid loading difficulties. Make sure your full name, age, address and telephone number if you have one, are clearly printed on the cassette and on any documentation you send with it.

Post your entry to: Computer Program Competition, Room 5007, BBC Television, New Broadcasting House, Oxford Road, Manchester M60 1SJ. Not to *Computer & Video Games*, please!

Your program may then be featured on the Get Set series and you can tune in to see what the opposition is like as well. The rules are laid out below, so rush your entries in before the June 17th closing date.

RULES

1. The competition is open to all children residing in the UK who are under 16 years on July 1st 1983.
2. You may enter as many programs as you like but they must be your own

And there was my copy— all covered in garlic



In Transylvania you cannot always make it to the newsagents on the right day. Last 16th of the month, I couldn't get out 'til late and my newsagent had put a cross on his door. Well there hadn't been any plagues around (I talk to rats, I know these things) so I guessed he must be keeping my copy of *Computer & Video Games*.

Sure enough when I flew in the window, I saw my copy all covered in garlic — and it had Haunted House in it too! That's what I get for playing with my VIC all night, instead of terrorising the local peasants.

Anyway I had a little word just under my newsagent's ear and now we get on line.

Have a word with your newsagent — fill in the form (right).

original work and not copies of any other program.

3. The programs can be for any personal microcomputer currently available in Britain and should be submitted on cassette. Every effort will be made to load all cassettes submitted but should this prove impossible the judges can accept no liability.
4. Prize winners will be announced on 'Get Set'. Winners will also be notified by post.
5. The judges' decision will be final in all matters.

SAY GOODBYE TO SUSAN

This is the issue in which we magazine readers should say goodbye to Susan Cameron.

Susan, who has been with us since long before the first issue hit the newsagents and has personally answered more lasting queries than any other living human, is not leaving Herbal Hill.

She moves to a new job on the Marketing and Publicity Department and will still be involved with organising competitions and exhibitions for this magazine and many others.

While we will still see a good deal of

To my newsagent Please deliver/ reserve me a copy of *Computer and Video Games* every month. Price 75p

Name

Address

Susan around the office, her name will not be appearing on the *C&VG* masthead any more. She will be replaced by Clare Edgeley, and I'm sure Clare will find the *C&VG* readership just as challenging as Susan did.

As a parting note we are offering six of our spare Vulcan Electronics Hungarian Rungs (see *Puzzling* page) to the six readers who come up with the best thank-you letter for all Susan's contributions over the past 18 months. We will make our selection on May 16th. The judge's decision is final and no relatives of Susan Cameron may enter.

CONFESSIONS OF A BUG

The trouble with being a Bug is that you'll get blamed for everything. Take *Logger* in the last issue where the end of line 134 was unclear in some copies.

I'm sure we'll get the blame for that, but anyway it should read 56 at the end of that line.

Skyscraper on the Dragon 32 had a problem with line 70. It should read

70 ZS=INKEY\$IF B=D=0 AND ZS=" " THEN 100 ELSE IF ZS="!" AND RA>0 THEN IF PO>64 THEN PRINT@ PO,NPS,PO=PO-32,RA=RA-1

ANIROG

SOFTWARE

XENO II

An EXPANDED screen presentation with superb action packed space thrills, written initially in machine code with low action packed stages. To destroy the power source of Xeno II, you have to fight off waves of robot attack plasma bombing by the legions of the outer sanctum and finally attack the power source protected by a force field, continuing bombardment by guardians and blockading by wild whirling suicidal space ships. Truly a game for all arcades.

JS 16K £7.90

CAVERN FIGHTER

All M.C. version of SCRAMBLE. Lasers, bombs, continuous scoring and sound effects give all the thrills of arcade game. Pilot your space ship through the tortuous tunnels and caverns destroying enemy missile launchers, fuel dumps and airborne fire saucers. Four ships to complete mission 10 skill levels.

KBJ/S Unexp. £6

CRAWLER

All M.C. version of Cantipeda. Homing spiders, mushroom laying fleas and multidirectional travel makes this game fast and furious, with 10 skill levels.

JS Unexp. £6

PHARAOH'S TOMB

Once you enter, the only way out is with the aid of a key which unlocks the mystery of the Pharaoh's tomb. Beware of the midnight Egyptian spirits so painstakingly built. One false move and you will meet the same fate as the other tomb robbers over thousands of years. A multi-screen big graphical adventure with M.C. movements.

KB 16K £6.00

SEVEN PROGRAMS (VOL 1)

Seven games for the whole family. Board game Othello plus Bombs, Sleem, Bounce out, Lunar Dock, Memory and Snake.

K6 Unexp. £6.00



SEVEN PROGRAMS (VOL 2)

Another 7 games pack for the family. Graphical Adventure, Goblins Gold, plus Dera Devil, Ghosts, Grand Prix Breakout, Cobra and Minifield.

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KRAZY KONG

An EXPANDED screen, large graphics, rolling barrels, hammers, ladders, lifts, handbags and umbrellas as you try to rescue the damsel Kong has abducted. Spectacular collapse of Kong's law. In the fourth screen uses all 21K of your expanded Vic for this 100% M.C. thriller. Complete with high score table.

KBJ/S 16K £7.90

GALACTIC ABDUCTORS

New arcade game with fully EXPANDED screen. Space hawks are abducting the humans and also dropping eggs. A big 16K action packed arcade thriller in 100% machine code, M.C. graphics and multi skill levels.

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FROGRUN

Popular arcade game. All machine code with brilliant colour graphics and sound effects. Features include snakes, crocodiles, lady frogs, turtles, cars, lions and legs.

KBJ/S Unexp. £6

DRACULA

Count Dracula is asleep somewhere in his castle. He rises at midnight and you must find him and drive a stake through his heart before he rises. A multi-screen graphic adventure.

KB 3K £6

TINY TOT'S SEVEN

Super games pack for younger children with bright colour graphics and sound effects. Everybody's favourite Simon plus Super Snake, O and X's Word Jumble, Bomber, Duck Shoot and Mad Drivers.

KB Unexp. £6.00

DOTMAN

All M.C. version of the popular arcade game. Excellent colour graphics and sound effects complete with fruits, tunnels, running and highest score.

KBJ/S Unexp. £6

ZOK'S KINGDOM

You astronaut badly damaged in a meteor storm is forced to crash land on the planet ruled by ZOK, a time space gorgonised mummy of Dracula. You are challenged to a battle of wit and endurance as the battle for survival starts in earnest in this big multi screen graphical adventure in M.C. graphics and M.C. movements.

KBJ/S 16K £6

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THE WORLD OF PIMANIA

Dear Sir,
I have been playing Pmanua and I think I've drawn up a diagram of the system of Pmanua! Is the sundial on this planet or is it somewhere in space?

Barry Jones,
Croydon,
Surrey.

Editor's reply: It is possible that your diagram is complete, but we don't think you have yet passed through the Ultimate Gate of Pi, otherwise, the reality of the location of the Golden Sundial would have been revealed to you.

Don't simply travel around the world of Pimania. Talk to the Pi-man and do as many different things as you can think of. Don't be afraid to communicate through your keyboard.

BACK WITH THE DEBATE

Dear Sir,
I hope to add to the Spectrum Vs. BBC debate, and hopefully please both sides. I believe it is silly for Clive Sinclair, or anyone else for that matter to compare the two machines.

They are entirely different machines aimed at different markets, and should be kept so.

I own a Spectrum and have also used my school's BBC, and I was impressed by both machines.

The Spectrum is the world's best home computer for under £200 and the BBC is the best for over £200, and never the twain shall meet.

M. N. Jackson,
Cambridge,
Surrey.



FAMDUS LAST WORDS...

Dear Sir,
Hopefully this letter will end the BBC versus Spectrum conflict — which I am sure most people are bored with. I must agree with many of the points raised by David McKeran in the March issue in comparing the two.

However I do not feel that the BBC and the Spectrum can be compared considering the obvious differences between the two machines.

The BBC micro is an excellent machine exceeding the Spectrum in most areas and the buyer is certainly getting his money's worth — but the same can be said of the Spectrum. This is the crunch of the problem. Most people cannot afford a BBC micro. I would certainly like to own the more powerful BBC but have to settle, for the time being, as David McKeran put it, with "the jock-of-all-trades" with which I must add I am completely satisfied!

For all the pros and cons of every computer we should be

grateful for the chance we have in this country to be in the forefront of home computing and the opportunity to purchase an exciting and rewarding hobby.

Stephen Challis,
Exmouth,
Devon

Editor's reply: And with this letter we draw to a close the Spectrum v. BBC debate. Nuff said, OK?

PRAISE FROM ATARI FAN

Dear Sir,
I have been the proud owner of an Atari 400 computer for over a year now, and have been thrilled with your magazine. Recently we have had some fantastic programs, such as Submarine Hunter, Wordfind, Air Attack and most recently Over the Orchard Wall. Full marks to you and all these authors! James L. Campbell,
Bramley,
Surrey

MDRE ON THE ICE VENDOR

Dear Sir,
In your February issue of Computer and Video Games a reader complained about a PET/Apple program, Ice Cream Vendor from the November issue.

I was surprised to see that you didn't correct him. Deleting the "VTAB 10" could not possibly work the way it was meant to, because "VTAB 10" on the Apple means (as far as I know) slip 10 lines. So that the Pet version should read: 10 PRINT/then cursor down/then cursor right/****
Njal Finkenpeon
Stavanger,
Norway.

DISAPPOINTED BYGRILLA...

Dear Sir,
I am writing about the C TECH Krazy Kong. When my copy finally arrived — after a month of waiting — I was shocked. The game I got was either terribly bug ridden (which I doubt) or the advert is designed to mislead.

The game is supposed to be for the 16K or the 48K but in actual fact there are two versions. The 16K one is second on the tape and takes about 18 minutes to load because you must run through the 48K version first.

The game is so fast that it is unplayable but only the 48K version has scoring. I was very disappointed and I am going to send it back.
Ian Reddick,
Kirkaldy,
Fife.

SPRITES KEEP SMOOTH

Dear Sir,
Many thanks for your recent listings for the TI 99/4a computer which show the excellence of this underrated machine.

The ability to have 28 independently programmable SPRITES (smoothly moving graphics characters) and a "transparent" colour, allowing characters to move across each other, makes the simulation of arcade games a simple matter in TI extended Basic.

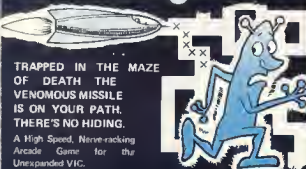
The new Commodore 64 proudly boasts only eight SPRITES, whilst the Atari equivalent "player missiles" are notoriously difficult to program.

Keep up the good work!
D. A. Johnson,
Acklam,
Middlesbrough.





missile-panic



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IS ON YOUR PATH.
THERE'S NO HIDING.**

A High Speed, Nerve-racking
Arcade Game for the
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In this remarkable game you must control Eric, the Road Runner, through the space war of vehicle molecules, and safely into the gravity space lanes. With ever increasing levels of play, a super cool head is needed to conquer this addictive machine code game.

For arcade enthusiasts everywhere

ONLY £5

ANDROID ATTACK

The Androids of Jupiter: an ever growing race are on your path in the maze of the lost Isle. They look more menacing as each second passes and will attack without mercy. Run to stay alive.

ONLY £5

SPACE HOPPER

Once these war invaders, then Peckman, now there's a Space Hopper. Can you guide your Space Frog through the hustle and bustle of space traffic without being crushed by intergalactic space items? Can you avoid being shot by hidden laser guns and are you able to hop through the space warp. If you think you can order it today!

ONLY £5

STAR WARS II

Only the Force can save you!! In this perilous journey through time and space, having conquered the evil empire, you must now follow Luke's steps and destroy as many of Xata's ships as possible. Your arms are limited and with a short supply of fuel time is of the essence: only the fli can survive, that is if the Force of Tien is with you!

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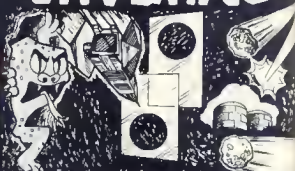
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NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW GAMES NEWS

NOW YOUNG BLADES GO FOR IT!

SWORDFIGHT

In days of old when men were bold and problem pages hadn't been invented, men fought to the death for the hand of a fair lady.

Romantic Spectrum owners can now battle it out for the favours of the belle of the local computer club with this latest sword fighting simulation.

The game is for two players at the same time using the left and right hand sides of the keyboard.

Comprehensive sword controls enable you to parry, cut, thrust, and move left or right.

When a fight is over — one of the players will either have died or surrendered — the program gives you an action replay to show the vanquished cavalier where he went wrong.

The duel is fought over a limited time. If nobody is killed in this period the match is drawn.

Swordfight at Midnight runs on Sinclair Spectrum in 16 or 48K and costs £4.95 from Fossil Software plus 35p postage.

Finally is a new software house set up by four sixth formers from Foxley Lane, Binfield, Berkshire.

AUTOMATA'S GREATEST 1K HITS!

BEST TASTE

Best Possible Taste is the latest release from the authors of Pimania — the game with the £5,000 prize.

It is a compilation of some of Automata's best known 1K ZX81 games featuring classics like Noah's Ark, Las, Reagan, Merry Xmas, Royal Fleets.

Thirty games in total are featured on this cassette, all for £5.

Pimania fans will also be pleased to learn that a sequel is currently under development.

The prize will be a trip to America for two and a meeting with a mystery Hollywood star whose name is hidden some-



where in the game. The person who discovers the identity of the mystery star will be the lucky winner.

Ciriously titled My Name is Uncle Groncho, You Win a Fat Cigar, the game will be available towards the end of May.

YOU'LL GO APE OVER KONG ...

CRAZY KONG

Cripes! The gobbler's got my gull! What am I gonna do now? He's taken her to the top of the steel fortress!

Pull yourself together, you chicken-hearted carpenter. Put down your tools and get up there and rescue your sweetheart!

This little domestic tale is familiar to all arcadesters and a few probes too now it can now be witnessed on the screen of your Vic-20.

This latest game from Interceptor Micas takes some of the action from the three screen arcade version of Donkey Kong and puts it all together in a one screen compilation.

Crazy Kong comes complete in a video film style cassette holder and is available from the Hampshire-based firm at £5.

Also new from Interceptor this month is a shoot 'em up space game with a weird and wonderful assortment of aliens called Fantazia, also available at £5.

FAST FOOD FOR HUNGRY MAZE FANS

GOBBLERS

If you are hungry for a new Atari game then Gobblers and Gobblins may be just the game to satisfy your appetite.

Benanas, cherries, hamburgers and milk shakes are all presented for consumption by your little gobbler, controlled with a joystick.

A constantly changing maze is created by the appearance of the gobblins whom you must avoid at all costs.

If you inadvertently eat one of these gobblins you will drop dead on the spot and an ambulance will appear to carry you off screen.

Gobblers and Gobblins is the latest game from Alliran software of Hayes.

It runs on the Atari 400 and 800 in 16K and is available from the Middlesex-based firm at £15.50 for cassette, and £18.95 on disc.

ATTACK OF THE MUTANT WHAT?

CAMELS

This year's prize for the computer game with the zaniest name has got to go to Llamasoft's new Commodore 64 game Attack of the Mutant Camels.

Canning aliens, having observed the disastrous attempts of fleets of space ships to invade Earth, have hatched a more devious plot. Those normally docile desert beasts — camels, have been transformed by genetic engineering into 50 foot high, laser spitting, neutronium shielded Death Camels.

Yoni mission is to rid the desert of these mutants before they build up sufficient numbers to take over the world.

Yoni is armed with a powerful cannon and the long range scanners show you the whereabouts of the camels.

Despite your heavy fire-power you will have to score several direct hits on the camels' neutronium shields before they are mobilised. Once this has been achieved you can move in for the kill.

But you'd better be quick, for if any of the camels manage to march to the extreme right of your scanner, Earth base will blow your ship to bits by remote control. Failure is punished by death.

Yoni ship has considerable manoeuvrability which you will need to nudge to the left in order to dodge the camels' laser fire and "nasty" bombs.

Attack of the Mutant Camels is available from the Basingstoke-based firm at £8.50. Camels is one of a range of Llamasoft games for the Commodore 64.



NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW GAMES NEWS

STICKING WITH THE WINNERS

QIX

Atari are continuing their policy of launching tried and tested arcade games for the 400 and 800 machines. This month's releases include copies of the two hit games QIX and Donkey Kong. Donkey Kong with the crazy gorilla, blond stilet, and Mad Mario the carpenter needs no introduction to arcadesters.

Slightly less well known but no less a good game is QIX, which was just featured at CBVG's Arcade Champ of the Year last summer. The idea of the game is to capture as much space as possible by drawing shapes on the screen.

Press the fire button to draw and move your marker around the screen avoiding the QIX — a large spark.

When you have filled in 75% of the screen you can move on to the next one or, for really high scores, you can fill in up to 90%. These games are available from your Atari dealer at £29.95.

Other new cartridges for the Atari computers are about to be launched by the English Software Company.

These will be available in May and will feature a new version of *Aurika* — the scrolling shoot-out *Aurika II* and *Vanus Vayager* are being manufactured in the U.S., although the programming was completed in the U.K. The games will be available in May but no information on price is yet available.

THINGS THAT GO BUMP IN THE MAZE!

MONSTERS

Ghouls, monsters, vampires and a Mad Monk are all featured in this latest Hitchcock style game for the Sinclair Spectrum.

Incorporating some elements of the arcade game *Dig-Dug* the game challenges you to escape from a maze of corridors and

connecting step ladders and adds some original twists of its own.

You are armed with a magic hammer which enables you to dig holes in the corridors for the monsters that are in hot pursuit to fall into.

Just to give this version its own original twist the monsters are vampire monsters and the setting is hell with the flames burning away beneath you.

You are also only allowed a limited amount of holy power so you have to use your hammer sparingly. Watch out for the Mad Monk and his Ghouls — they are also out to get you.

Monsters in Hell runs on the Sinclair Spectrum in 16 or 48K and is available from London-based Softek at £5.95.

Also new from Softek this month is a version of the popular arcade game *Centipede* and a deep space shoot 'em up game called *Firebirds*. These are also available at £5.95 from Softek.

GET YOUR TEETH INTO THIS ONE!

MOLAR MAUL

If you think that using your TV set to play computer games provides an escape from those toothpaste advertisements that keep reminding you of your dental appointment then *Molar Maul* will put an end to all that!

This new game allows you to take part in the fight against the DK's who are trying to destroy your teeth.

The tooth wreckers come in the apparently harmless guise of Jolly Babies and toddlers but, as every dentist will tell you, they can do irreparable damage to your gnashers.

To fight the good fight you are armed with a toothbrush and a tube of Imegico toothpaste.

Moves the brush around the mouth which is displayed on the screen using your keyboard controls. Every so often you will need to go to the tube of toothpaste to recharge your brush.

It becomes increasingly difficult to brush away the DK's as the game gets later and later.

Molar Maul runs on a Sinclair



Spectrum in 16 or 48K and is the latest release from Imagine Software of Liverpool.

Also new from Imagine this month is a Vic game called *Francis*. You are a robot on a mission to mine the precious mineral hidden at the bottom of a deep trench. Your jet pack enables you to fly through the obstacles that will confront such as attacking aliens and uncertain terrain.

Imagine games are available from the Liverpool based firm at £5.50.

FLIGHT OF FANCY IN THE STARS

STARSHIP

Starship Command adds a number of extra flight controls for your *Starship* as you hurtle through space zapping the aliens.

Your ship can accelerate, decelerate, rotate and fire torpedoes. There is a shield which you can activate to protect your ship from enemy fire and two escape capsules either of which can be launched before your energy banks are drained empty.

On the night of your screen your long and short range scanners show the whereabouts of the alien ships.

Just like Atari *Star Raiders* you have only a limited amount of fuel to complete your mission and this is eroded each time you fire torpedoes, accelerate to decelerate, use your shields or sustain a direct hit from an alien ship.

At the end of your mission you get an assessment from the *Starship Commanders* and depending on your performance you will be given another more difficult mission to carry out. *Starship Command* runs on the BBC model B and costs £9.95 inclusive from Acornsoft of Cambridge.

Also new from Acornsoft this month is a snooker simulation game which lets you become Steve Davis for an afternoon.

The length of the cue you select determines the strength of the shot. You can also instruct the computer to use backspin, topspin for those special tick shots.

Normal snooker rules apply including foul shots and snookers. The only thing this snooker game lacks is a £10,000 jackpot. *Snooker* runs on a model B at £9.95 inclusive.

CLASSICS FOR THE ORIC OWNER...

AWARI

Two classic games have found their way on to an Oric format to start off the software libraries for owners of this new computer.

Awari, the African pebble game, is reproduced on cassette for £5.50 and *Othello* should also prove popular at £6.50.

The tapes come from a new software house, run by the Tangent User Group's Bob Green. It is called Kenema Associates Limited and is based at Worle in Avon.

Two other cassettes are also being released by Kenema for Oric owners. *Keyfinder* is aimed at giving 6-12 year olds a familiarity with the machine's keyboard, while the *Character Design Aid* enabling beginners to make good use of the Oric's user definable graphics facility. Both these cassettes cost £5.50 each.

NEW PRODUCTS NEW PRODUCTS NEW PRODUCT GAMES NEWS

OUT COME THE FISHY FREAKS!

SEVEN SEAS

Thorn EMI's latest game has a conservation theme — it contains a warning about the dangers of dumping toxic nuclear waste in the sea.

The guaranteed "safe" canisters have started leaking radioactive substances into the ocean currents.

The creatures of the deep have been transformed into crazed mutant monsters out to take revenge on mankind.

As the captain of a submarine your task is to journey to the bottom of the sea and collect the canisters. Then you have to transport them back to the surface for processing.

But watch out for giant octopi who are hooked on the stuff in the canisters!

Save the Seven Seas runs on the Atari 400 and 800 and is in the shops now.

Also new for the Atari are a sports simulation game called a Major League Hockey and Orc Attack.

The latter game which challenges you to repel an attack of ferocious Orcs who are attempting to storm your castle.

T193/4s owners have also been included in Thorn's spring releases with compatible versions of their TV advertised games, Submarine Commander and River Rescue.

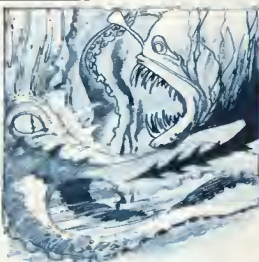
New games for the Vic-20 include Mutant Herd in which you must find and destroy mutant eggs which are hatching into giant man-eating insects.

Dodge falling rocks and avoid the insects as you lay your explosive charges to destroy this threat to mankind.

Fourth Encounter — the second of the Vic-20 releases is a classic shoot 'em up space attack game.

You and your laser base against the aliens. The rest is history.

Thorn EMI cartridges will be in the shops in May and will sell at around £30.



THE FLYING FORTRESS COMES HOME!

ZAXXON

Zaxxon is widely regarded as representing the "state of the art" in graphics for 3D games.

The blue fortress with its ground-to-air missiles and high flying jet fighter needs no introduction to a reader.

It's a superb sight — that Zaxxon screen, with missiles blasting up at you from the fortress floor as you zap over walls and electric defences, judging your height by your shadow.

The game was first converted for the home by Colecovision for use on their video games centre which is shortly to go on sale in the UK.

The good news for home computer owners is that the game has now been converted for the Atari 400 and 800.

The game requires 7K and is available from Calisto Computers of Birmingham at £29.99 on disc or cassette.

Also new from Calisto this month is Astro Chase, the new game from Fernando Herrera — the award winning ex-Atari games writer.

ROOMS OF DOOM FOR ADVENTURERS

TOMBS OF KARNAK

There are fifty rooms to be explored if the intrepid Sharp MZ-80K owner is to find his way around the Tombs of Karnak.

This is a classic adventure game where you have to overcome challenges and evil characters in fifty different locations.

The game is available from Solo Software of St Johns in Worcester. It runs on the Sharp MZ-80K and MZ-80 and is available at £7.95.

ENTER THE WORLD OF THE CRYSTAL

DARK CRYSTAL

The lost shard of the crystal is the key to a new graphic adventure game based on the new film, The Dark Crystal.

The flawed crystal is being used by ten evil creatures, the Skeksis, to pervert the way the world is run.

They are opposed by 10 gentle creatures, the Mystics, forces for good on the planet.

An ancient prophecy foretells that the Skeksis rule will be broken by Gelfling and the crystal made new again. So the Gelflings were wiped out by the Skeksis' deadly agents many years before and only two, Jen and Kira, survive to make the prophecy come true.

The game is produced in America by Sierra On-line and features some marvellous graphic screens.

In the UK, Apple and Atari versions are being distributed by South-London based SBD Software. A Commodore 64 version is also expected to be released over here shortly. The game comes on disc and although prices have yet to be confirmed, it is expected to sell for around £20.

We are running a Dark Crystal graphics competition on page 24.

The game challenges you to defend the Earth from an invasion of aliens who have thrown a force field around our galaxy. Once they have launched their attack vessels the chase is on.

Astro Chase also runs on the Atari 400 and 800 in 7K and comes on disc or cassette at £26.50.

TAKE TO THE AIR FOR A TUTORIAL

MAP OF UK

Map of UK gives a new meaning to crash courses in geography. It's a game with a strong educational bias for Spectrum owners.

The cassette provides a large scale map of all the United Kingdom plus Eire. The action takes place in an addictive hot-air balloon game, search for a named place, work out the distance between two places, display latitude and longitude and it is also possible to remove names from the map to play "guess the place".

The game comes from Kuma Computers of Maidenhead.

It costs £11.95 and should make geography a lot more fun for those who can follow a course without crashing.

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HOT TIME IN THE OLD CASTLE

DRAGONFIRE

Following Imagic's successful Riddle of the Sphinx Adventure game for the Intellivision machine, which had a clutch of cartridges as a prize for the most intrepid explorer, the American firm has just launched a second Intell Adventure.

Dragonfire turns you into a Prince who has been given the task of ridding the kingdom of the dragons who have taken over the castle. Then you must restore the rightful king to the throne.

In order to do this you must first get inside the castle. Using the joystick controller direct the Prince across the bridge, dodging iceballs and the arrows from an archer positioned high on the castle turrets.

Once inside, head for the treasure room to recapture the king's riches.

Now the battle gets tough. You will have to fight it out with a dragon which has varying strength — depending on which difficulty level you select.

Treasure recovered, the Prince must then cross another bridge and face a tougher dragon. Points are awarded for each item of treasure recaptured.

Dragonfire can be played by one or two players and is available from most Intellivision stockists now at £31.45.

Two other new games for the Intellivision feature a version of Donkey Kong called Beauty and the Beast.

Instead of mad Mario and the gorilla this game introduces Horrible Hank, Tiny Mabel, and Beshful Burford.

You play the part of Burford, who is trying to rescue his girlfriend Mabel, from Horrible Hank who has carried her to the top of a sky scrap.

Also new in the shops is the Intel version of the hit Imagic game Demon Attack.

Demon Attack and Beauty and the Beast are available now from your Intellivision stockist at £31.45.



LOOK FOR THE GROND

VANGUARD

Atari's Vanguard is the most original release from the leading video games firm for some time.

This game incorporates several challenging screens.

Like most new games there is a complex story line. You are challenged to fight your way through to the fortress of the evil Grond and destroy him. Not that any of this has anything much to do with the real enjoyment of this game — dodging, and blasting.

The last screen challenges you to shoot your way through a scrolling tunnel. The aliens are coming thick and fast and you will need to utilise your ship's ability to shoot forwards back wards end up and down to lull in order to shoot down enough of them to get through to the next screen.

Screen two provides an interesting twist as you are now scrolling downwards instead of forwards. Your adversaries at

this stage are cute ping-pong ball type characters which bounce across the screen and edge slowly down towards you.

A couple of screens further and the aliens are backing you up screen.

When you are finally approaching the Gronds fortress you are pursued by serpents and snakes that can immobilise you with poisonous bites.

Vanguard has a useful game play feature which allows you to start your next game where you left off if you press for a repeat game before the indicator reaches zero.

The game play is so fast and incisive that Vanguard is guaranteed to give you joystick blisters.

The game also incorporates excellent use of the VCS's colour capabilities. Vanguard will be in the shops in May at £39.95.

BOMBERS GO OFF WITH A BANG!

ASSAULT, ASTROWAR, SPACE ROBOT

The Bomb has dropped! This new games company is launching a major assault on your Atari VCS and has attacked the UK market with a new game called Assault.

This challenges you to blast wave after wave of aliens with your laser base and it owes a lot to the successful Imagic game, Demon Attack.

The screen displays a mother ship which is moving back and forth across the screen — constantly — just out of range of your laser fire.

In order to get a potshot at the mother ship you will have to first shoot your way through several waves of aliens.

One of the most enjoyable aspects of Assault, and certainly that which gives it its main claim to originality, is the ability to live left and right as well as up screen. You will need this facility as certain of the aliens drop Grabbers which dart across the bottom of the screen towards your laser base. Left joystick control and a quick finger on the fire button are required to survive this wave.

One other new VCS manufacturer launching into the UK market for the first time VIA Pancom did not meet with quite as favourable a reaction from our resident Atari expert.

Astrowar from Dimex is a scrolling shoot out which, graphics wise, gives a new meaning to the word basic.

You are challenged to shoot down a bell of meteors that are bombarding your ship. Larger rocks split up making for more difficult targets.

Dotted in and around the meteors are a few sneaking aliens moving at greater speed than the rocks. These must be eliminated at all costs. If they slip past you you are dead.

Slightly more original though still not in the super-game class was Space Robot, also from Dimex.

Not a Bazooka-type game as the title might suggest but a shoot 'em up style game incorporating some of the best elements of Missile Command.

The robots are attacking in three marching down the screen in neat rows.

You control a gun sight with your joystick which you must position at the centre of a robot. Press the fire button to position a laser blast on the chosen robot.

Assault, Astrowar, and Space Robot are all available at £1.95 from Pancom of Gumsby in compatible PAL format.

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| 2 Frogger | Atari VCS | Parker |
| 3 Defender | Atari VCS | Atari |
| 4 Space Invaders | Atari VCS | Atari |
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SWINGING TIME IN THE JUNGLE

PITFALL, STAMPEDE

Something is stirring in the jungle — and it's not just the wild beasts. It's Pitfall Harry, the latest video hero.

Harry is the central character of a new game from Activision for the Mattel Intellivision home video system. It features the only standing audio-visual effects that have become the trademark of the game's creator, award-winner David Crane.

Harry travels through dense jungle and underground passageways in search of gold and silver bars, money bags and diamond rings. Along the way he encounters bottomless tar-pits, deadly snakes, scorpions, lizards, crocodile infested lagoons and rolling logs. Pretty tough huh? All this adds up to an exciting and original game.

Activision's recent release for the Intellivision is Stampede.



game mentioned within the pages of C&VG frequently during past issues. Activision say that this is one of their most popular games — it was created originally for the Atari VCS and introduced in 1982.

The theme is the good old Wild West and you are out robbing on a stray cattle which just happen to be rushing around in a panic stricken state.

You have to direct both horse

and rider as you attempt to lasso the stampeding steers. Points are up as you rope the docile little dogs. Bob Whitehead, who designed Stampede, is also the creator of that other popular game Chopper Command which took the USA by storm.

Pitfall and Stampede should be at your local Activision stock list right now. Pitfall will set you back around £29 and Stampede is slightly cheaper at around £25.

HYBRID FOR VIDEO AND MICRO FANS

CREATAVISION

If you can't decide whether to buy a computer or a video games system then the new Creatavision system may be the solution you are looking for.

Best described as a cross between the two machines, Creatavision will go on sale in April with a range of twenty video games cartridges.

But the machine can do more than just play games as it incorporates a 16K Intel programmable computer with a keyboard. The package comes complete with its own Basic cartridge and retails at £99.00.

The computer is fully expandable and all the usual peripherals will be produced later in the year. A compatible cassette recorder, disc drive, printer interface, and expansion cartridges up to 64K are all on the way.

Creatavision are hoping to attract some of the independent software houses in the UK to write games for their machine. As this will take some time to organise there is likely to be a shortage of the cheaper cassette based software for this machine, than for the cheaper machines like the Spectrum and Cric.

Cartridges for the Creatavision will range in price from £19 to £25 and include additional and business orientated subjects as well as a range of arcade style titles.

PRETTY TOUGH OR JUST PRETTY?

Demon Attack and Phoenix give a new meaning to the phrase "pretty tough". Both are shoot 'em up space games — and both are competing for sales in the lucrative Atari VCS market.

The similarities in game format and design have led to a legal battle in the US between Imagic, the manufacturers of Demon Attack, and Atari, the owners of the Phoenix copyright.

Demon Attack has been on sale for nearly twelve months now and was voted top video game of the year at the January Consumer Electronics Fair in Las Vegas. Having sold over eight million other video games in the US last year.

Computer and Video Games resident VCS expert plugged in both games to see which one gave the toughest fight. First up on the screen was the brand new Atari cartridge Phoenix.

The last two screens were wiped out in seconds as they attacked an insultingly slow

DEMON ATTACK Vs PHOENIX

pace — like drunken space invaders out of formation.

After the formality of dismissing these last two screens I was pleased to discover a tougher bird of alien on the third screen. These bird-like creatures were quick and elusive, showering me with heavy missile fire.

Tough as these aliens are they are not as tough as their counterparts in Demon Attack and the only real test for the seasoned video gamer comes on the fifth screen when you get to the Phoenix home base.

Now this is impressive and a reasonable simulation of the arcade game's exciting climax. Using skilful movement of the joystick you have to dodge in and out a missile into the Phoenix fortress whilst dodging their heavy fire.

It may take several hits to erode the aliens' defences but

you can get a clear shot at the centre of the Phoenix.

All the time the great bird-like hulk is edging down the screen towards you. Laser beam.

Demon Attack was plugged in with a measure of excitement and slight concern. It was six weeks since I'd played the game and during that time I hadn't been late for work missed an appointment, or missed a two hours late for dinner once!

The game is pure addiction. You just have to have one more go. Go to see one more screen of different aliens.

The main reason for Demon Attack's enormous success, apart from the tough game play is due to the exceptional graphics.

They are detailed bird-like creatures, some of which fire long snaking beams of laser fire.

Phoenix is pretty tough but for my money Demon Attack is tougher and prettier.



At last. A range of software that's as well designed as the Dragon 32.

Six months ago, most computer users thought a Dragon was something out of an adventure game.

How times change. Nowadays, it's almost impossible to pick up a computer magazine without reading some new tribute to the Dragon 32.

THE FIRST FAMILY COMPUTER

We called it the first family computer. And we believe that much of its success derives from the fact that it has been superbly designed for the job it has to do.

Design that incorporates 32K RAM of memory at a real value-for-money price level.

Design that utilises the advanced 6809E microprocessor.

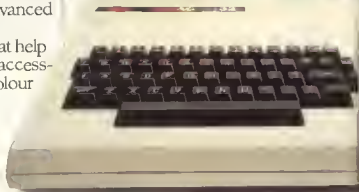
Plus a range of features that help make the world of computers accessible to first-time users. Like colour drawings. 5 octaves of music.

And plenty of power and versatility to keep up the interest as your experience increases.

SOFTWARE TO MATCH

Designing a range of software that does justice to the Dragon was a task we approached with as much care as designing the computer itself.

The results are now available - games, educational programs, hints on programming - conceived by some of the best software houses in the world, to help users get even more out of their machines.





Graphic Animator.

A cassette that makes use of the Dragon's ability to draw on the screen. It shows you how to create simple cartoons - then bring them to life.



Personal Finance.

This cassette allows you to keep track of all the family's finances, from bills to bank statements.



Ghost Attack.

On cartridge. You're in a maze, and you must find your way out. But you're not alone - you're pursued by ghosts!



Chess.

A great partner to play against again and again - with one major drawback. It's very hard to beat. Test yourself against nine different levels. On cartridge.



Typing Tutor.

Only a keyboard as sophisticated as the Dragon's could allow you a program like this. You use the Dragon's own keyboard to learn to type. On cassette.



Cave Hunter.

Finding the hidden gold is hard. But surviving the attacks of malevolent creatures may well prove to be impossible. Cave Hunter is on cartridge.



Dragon Selection.

A cassette of utility programs, allowing you to create your own database. Write your own tunes - or learn other language vocabularies.



Starship Chameleon.

A cartridge game. You find yourself under attack by the dreaded Gabolators! Their task is to take your planet - yours is to protect it.



Computavoice.

This cassette actually enables your Dragon to speak to you.

These are just some of our titles, and every month, we'll be adding more and more.

What you get out of a computer depends on what you put in. And with a Dragon 32 and Dragon software, there's enough challenge and satisfaction for anyone. But then, that's what it's designed for.

DRAGON 32

The first family computer.

CREATE YOUR OWN VISION FOR AUGHRA

The eccentric Aughra is Keeper of Secrets on the world of the Dark Crystal. She sees the strange life of her planet through a detachable eye and a permanent frown. We are offering her head to the winner of our Dark Crystal Competition!

Muppet producers, Henson Associates are flying a mask of Aughra's head over to the UK to give away as the prize for the best computer picture of a character from the film.

On top of the mask — one of three characters made by an American designer — the best graphical drawing will earn its creator a copy of the beautifully illustrated book about the making of the film plus an LP of the soundtrack.

The film's characters have already featured on a graphical adventure game which is available across a range of three micros — see our Games News pages.

The Dark Crystal features a horde of fascinating characters created by the pen of fantasy artist Brian Froud and then translated into the marvellous Muppet-like costumes and puppets by Jim Henson's team of Muppeteers.

As well as the one-eyed Aughra, there are the 10 evil Skeksis creatures who currently rule the world and the flawed crystal.

These are served by the poor exploited Pod People and a strange species of giant clawed battle fleas, the Garthum.



The gentle Mystics form the side of good and they send the Gelfling, Jen, in search of the missing shard of crystal. In his quest Jen is helped by a girl Gelfling, Kira, her friendly monster Fizzgig and a couple of steeds, the Landstriders — complete with walrus mustaches, floppy ears and giraffe legs.

You can choose any character or



scene from the film on which to base your creation and draw it on any popular microcomputer. We will accept a tape with the program on it or a screen photograph as long as it is clear. Please send your entries in by 20th May. If you want your tape or photograph returned, please include an S.A.E.

We have included a few pictures of some of our favourite characters from the film, to help you choose which to feature.

The judge's decision is final and no employees of EMAP or Henson Associates or their relatives may enter.



On a recent raiding trip to Matlock in Derbyshire, top space pirate, Nicholas Tacticos has plundered a Colour Genie microcomputer.

He is pictured with the company's marketing manager, Richard Peal, as the two of them take the Colour Genie through its paces on a game of Skramble.

Back at his London W14 base, Nicholas, who commands the Spartans space tribe, hopes to put his Genie to good use, conjuring up some hot moves for the next reincarnation of the late lamented Seventh Empire.

You can read all about the disaster which brought about the fall of the Seventh Empire on page 95. The Computer and Video Games office is at this moment preparing for an attack by hundreds of unhappy space pirates!

ORIC SOFTWARE from TANSOFT

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This year the fourth World Computer Chess Championship will be held in New York from October 2-25, 1983, at the annual meeting of the Association for Computing Machinery (ACM).

The championship is being organised by the International Computer Chess Association (ICCA) which was formed at the second World Championship in Toronto in 1977 and has since grown considerably in stature and influence.

ACM has allocated \$29,899 to cover the major tournament expenses and ICCA is now canvassing for further funds to enable it to bring noted chess players and computer scientists together at the tournament.

It is an indication of the growing respectability of computer chess that there will also be a special session devoted to the subject at the annual ACM conference which will be at the same site as the tournament.

BELLE OF THE BOARDS

If the fourth championship follows the same pattern as the first three, which is likely, it will be a four-round Swiss-style tournament amongst approximately 16 programs.

Four rounds is barely adequate for a tournament of that size, but any increase would impose serious problems for competitors whose programs reside on mainframe computers, possibly on the other side of the world, accessed from a terminal over the telephone network.

Arranging hours of dial-up access, free of computer faults (or routine shutdowns) and hours of international phone calls without interference or accidental disconnection is hardly the easiest of tasks.

For this reason, amongst others, it is likely that microcomputers will take part in the tournament in greater numbers than before.

Although strictly a special purpose chess machine rather than a microcomputer, one contestant that will not have to rely on telephone lines and mainframe computer operators will be Ken Thompson's BELLE which has been described several times in previous articles.

BELLE finished equal first with CHAOS (also of the USA) at the Third World Championship at Linz, Austria, three years ago. Each program finished with 3½ points out of 4 and a play off game resulted in a powerful win for BELLE.

It is difficult to imagine BELLE failing to retain the championship in New York, but a short tournament naturally puts far more pressure on the best competitors than a long one. Even one mistake or machine breakdown can result in an irredeemable loss.

Barring breakdown or human operator error, the outcome of a computer tournament is completely predetermined before the first move is made, but this is not likely to deter a sizeable audience from attending the playing sessions.

World Championship Tournaments are held every three years at present — beginning at Stockholm in 1874 where the first championship was won by the Russian program Kaisa.

At that time Kaisa seemed unbeatable, but it lost heavily in the first round of the Second World Championship at Toronto in 1877.

This was the decisive position



Dutchess (White) has just played 34. QxRch. Kaisa (Black) surprised the entire audience, which included Mikhail Botvinnik, Edward Lasker, Hans Berliner and Canadian International master Leon Pusetski by playing 34. R-K1, which places a Rook en prise.

Dutchess replied 35. QxRch and won a few moves later.

The immediate problem for Kaisa's programmers was to discover what subtle programming error could have led to this disastrous blunder. It will reveal the answer next month.

With Kaisa unexpectedly beaten in the first round, the American program Chess 4.6 took the lead and went on to win the Toronto Championship with 4½.

Thus turned out to be the high point of the career of the "Chess" series of programs written by David Slate and Larry Atkin.

The successor of Chess 4.6, Chess 4.9, only scored 2½/4 at Linz in 1980, a full point behind BELLE.

Here is the first round game from Toronto in which Chess 4.6 beat BCP. 6

British competitor which is also likely to be competing at the fourth World Computer Chess Championship in New York this autumn.

Chess 4.6 (White) v BCP (Black)

1. P-K4, P-K4;
2. N-KB3, B-QB3;
3. P-Q4, PxP;
4. B-B3

The Goring Gambit which Chess 4.6 played regularly as White and which presumably occupied a large proportion of its 5,6990 position opening "book".

However, very few of its opponents ever seemed to take the trouble to prepare for the gambit.

In this case, because of technical problems BCP was playing without its usual 1,099 position "book", but finds an unusual combination which took Chess 4.6 out of its "book" and into a probably inferior reply.

4. ... Q-K2;
5. PxP, OXPch;
6. B-K2, P-Q4;
7. N-QB3, B-QN5;
8. O-O, BxN;
9. B-DSI

Now BCP plays very weakly.

9. Q-K2;
10. PxR, N-B3;
11. Q-N3, N-K5;
12. R-K1, Q-K3;
13. N-KN5! Q-Q2;
14. P-KB3, P-KB4
15. PxN BxP;
16. BxP! PxR;
17. RxP ch



17. ... N-K2;
18. Q-B7ch, K-Q1;
19. OXP, O-K1;
20. N-B7ch, K-Q2;
21. NxR, K-Q3
22. RxN, QxR
23. B-R3ch, K-B3;
24. QxQ, P-KR4
25. Q-B5ch, K-Q2;
26. R-K1, P-R3;
27. Q-O5 mate.

BY MAX BRAMER

We at Silics Ataris are pleased to announce some fantastic reductions in the prices of the Atari 400/800 personal computers. We believe that the Atari at the new price will become the U.K.'s most popular personal computer and have therefore set up the Silics Atari Users Club. This club already has a library of over 500 programs and with your purchase of a 400 or 800 computer we will give you the first 100 for no charge. There are also 500 programs for professional use, and you can buy more programs, some are listed below. Complete the reply coupon and we'll send you full details. Alternatively give us a ring on 01-301 1111 or 01-301 1111.

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Don't buy a TV game! Buy an Atari 400 personal computer and a game cartridge and that's all you'll need. Later on you can buy the Basic Programming cartridge (25\$) and try your hand at programming using the easy to learn BASIC language. Or if you are interested in business applications, you can buy the Atari 400 + Disk Drive + Printer together with a selection of business packages.

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George Lohr	Do Re Mi	World War II	Music

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ICAG 2580: Composites & Metals Series May 1987



ARCADE



You've all been reading about those top scoring video-gamesters in these pages for some months now. How about letting us know about some of your pinball top scores?

If it appears that more video-lans are sampling the delights of pinball, I recently heard about one such video freak who found his favourite screen machine occupied by another eddect and was looking around for something to play to pass the time until he could get in on the video act when he spotted a pinball lurking in the corner of the arcade.

He wandered over, slipped a coin and began playing — and now, like many other people before him, he's totally hooked!

If you have been won over by a pin just let us know your high score, what machine you clocked it up on, your address and what arcade or pub your pin can be found in and we'll attempt to draw up a list of our top ten players.

STAY COOL AND BEAT THE STING

PENGO TIPS

Sno-bees are wary little creatures, not unduly malicious they seem to kill Pengo almost by accident. However the little devils know an ambush when they spot one.

In Pengo the player is a lone penguin up against a swarm of the creatures which try to run him to ground in a maze of blue ice blocks.

The bees possess a deadly sting which send Pengo sprawling onto his back and looking decidedly dizzy.

Pengo has two methods of fighting back. He can squash the bees behind a speeding ice block or "peck" the surrounding wall of the screen, stunning any Sno-bees who happens to be in contact with it.

Like all move games, Pengo is a battle for survival and a lesson in the art of ambush, and Sno-bees know all the tricks!

The scoring though depends on more than just surviving.

There are three ways to make the most of each Pengo screen in terms of points and a good player will decide early on which method best suits each particular maze.



The way most beginners start to score is by squashing individual bees and eventually clearing the screen.

Squashed Sno-bees are worth 480 points each when tackled individually.

But come the end of the screen, when the last bee dithers and then dashes headlong into a corner to disappear, the bonus score based on time taken to clear the screen is often miserly.

To clear the screen quickly can boost a score. One way is to note each of the flashing ice blocks which will later turn into Sno-bees and peck them to disintegration before that change can happen.

Don't spend time planning an ambush for a wandering bee — they usually avoid them, especially at close quarters — but take your chances when they come. Learn to recognise pat-

terns of bee movement when one starts melting a chain of blocks, it is a safe bet to wait behind the last one and squash him.

The second way to achieve a big score is to squash multiple bees with one block. Like eating Pacman ghosts, taking two bees with one shot earns bigger scores, of 1,600.

It is a legitimate tactic to aim for as the bees have a habit of following one another up a corridor of the game.

Making bees dizzy along the side of the screen can also leave them open to this tactic.

The third way to collect points is to push the three permanent ice blocks together. This tactic must be practised to appreciate the right way of approaching the untiring of the blocks.

It is often most practical to achieve this along an edge of the screen. Just getting two of the blocks together adds a bonus but the big score is achieved by linking all three.

Don't leave this tactic until the last Sno-bee is about to dive off screen as it will probably be too late, but look for opportunities to work the permanent blocks into good positions during the course of the screen battle.

Remember that the bees can't destroy those blocks either and they can therefore make useful hiding places for Pengo when he needs a break!

WHAT'S BUGGING YOU NOW — MORE INSECTS!

The bugs are back with a vengeance! Just when you were conquering the nasties of *Conquered*, the horrors of *Millipede* have arrived.

Like its predecessor, the *Millipede* starts at the top of the screen, snaking its way through the giant mushroom forest and splitting whenever it is hit by an arrow.

A released tail segment will turn into a new head, a *Millipede* reaching the bottom will produce new heads, entering from the side of the screen.

The spider still features, jumping up and down in a random pattern across the screen, but there's a host of new creatures too. The bee bombards the player much as the flea used to but a fast hit only serves to make them dash around the screen that much faster!

The dragonflies do a similar job, depositing mushrooms on their zig zag downwards path. Mosquitos fly diagonally across the screen. If hit by the player,

MILLIPEDE

the playfield scrolls up one row.

Earwigs glide across the upper portion of the playfield poisoning any mushrooms they touch as the scorpion used to. Beetles run any mushroom they touch into an indestructible flower. A hit on the beetles will scroll the screen down one row.

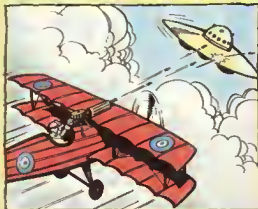
The inchworms crawl slowly across the screen and each hit on one will slow the action down for 3½ seconds leaving the player some much-needed breathing space.

At certain play levels a destroyed *Millipede* will result in a bombing run of bees, dragonflies and mosquitos.

The player does have one other weapon to help with this invasion.

Four DDT bombs are placed on each screen and can be blown up by an arrow releasing their deadly gas to destroy anything in the vicinity.





FLIGHTS OF FANTASY

TIME PILOT

A flight through the five ages of man's domination of the air takes place in Time Pilot.

The player steps into the cockpit of a modern-day jet and instantly finds himself transported back in time to the era of the bi-planes, circa 1910.

The bi-planes, tackled singly, are no match for the jet but there are a lot of them and they keep up a persistent hail of bullets. Then motherhood takes the shape of a large balloon and it must be hit seven times to allow the play to time warp into the next age.

He rematerialises in the Second World War, 1940, where monoplanes fill the skies.

Still, he holds an advantage but must use it wisely to counter the threat of the fighters and bombers.

On into the seventies as jet-range helicopters armed with deadly homing missiles take on the player's jet. The helicopters are far more manoeuvrable, appearing out of the clouds, all around the player's jet. A large copter with two sets of blades, takes on the roll of motherhood.

The fourth age of flight, takes the jet into the present with modern day planes like itself.

The fifth age is the future with UFOs and flying saucers providing the ultimate challenge. Then technology far outstrips that of the player's jet and they are armed with powerful weapons.

More points can be accrued by catching and rescuing parachuting pilots.

PACKING A PUNCH!

POPEYE

The cartoon character who made a Spinach Marketing Board redundant long before such things were fashionable, has now punched his way into the arcades.

Popeye and the entire team of unlikely characters which made up his cartoon series are battling arch villain Brutus.

Very much in the "cute" mould with three screens all featuring levels and ladders, the player controls Popeye catching hearts, musical notes and lettering as they drift down the screen after being carelessly scattered by Olive Oyl.

Our seafaring hero starts at the top of the harbour scene running up and down ladders in an effort to dodge Brutus but still be sure of not letting a single heart fall.

Brutus will lunge and punch through the levels as well as being a threat on the same level. He and a Sea Hag character also pose another threat by hurling bottles at Popeye.

Popeye can punch his way out of this kind of danger but the timing of that punch is critical.

Once Popeye's house is covered in captured hearts he can move onto the next challenge. The action takes place in a warehouse this time with Popeye catching falling musical notes from Olive's flute. Sweet Pea is at the top of the screen filling in a score for each note caught.

Wimpy munches hamburgers

one wants for Popeye to jump on his see-saw. A completed musical score sees the action move to a third challenge on board ship. Ms Oyl is trapped at the top of the mast and calls "help", the letters drifting critically seawards. Joining in the fray here is a culture who swoops down on Popeye.

And the spinach? That turns up in cans which turn Popeye pink with vitality and allow him to hit back at Brutus for as long as his theme tune sounds.



SPLIT SCREEN HERO

Battle was joined on the Robotron scene with a rush of scores finishing with Spence's May narrowly pipping the rest with a phenomenal 3,575,800 score.

Danish reader Michael Panayotis starts us off on Space Dungeon and Greg Parsons gives us a top Zaxxon score.

Greg also tells us about a local arcade hero in Worthing who has "split the screen" on Pacman.

This is achieved by going beyond the 240th "key" screen which causes the screen to split and the right-hand-side to be covered in coding.

This has been achieved several times in the States but I have not heard of anyone else managing it in Britain.

Il Mun-Chi Yip would like to get in touch he should find a secure place in our Record Breakers charts.

All you record breakers should be rushing to your local arcades with the form to be found on page 11 of this magazine where you'll find details of our search for a new champion.

Final note: Martin Stone has also beaten my own transitory record on Pongo but I'll be back!

GURF
1,511,950
Greg Parsons
PONGO
374,950
Martin Stone
ROBOTRON
3,575,800
Spencer May
FROGGER
137,200
B. Walsh
MOUSETRAP
621,700
Michael Elliott
SPACE DUNGEON
154,865
Michael Panayotis

WILLIPEE
143,791
David Ross
DONKEY KONG
884,700
P. Evans
HYPERBALL
3,324,200
Nick Stankovic
ZAXXON
715,950
Greg Parsons
TEMPEST
1,040,260
Paul Mitchell
AMIDAR
782,610
Adrian Eyre

It's a big day for the new Formula One world champion. His team are testing the new car which they plan to use to defend their championship title in the new season—just a few short weeks away. Today is the day when the champ gets behind the wheel of the new car for the first time. Will he be able to match his world-beating performance and defeat the fastest times of his four-wheeled opponents?

Your aim is to see how long he can survive on a rigorous test circuit. Sounds easy, but there is oil on the track and the cars handling is not good. The object of the game is to survive as many laps as possible in as short a time as possible.

The car slows down in the oil patch and sometimes skids. So watch out! It's not all bad, you can choose the colour of your car and your

testing race circuit.

The program has been written for an Atom with floating point ROM and no colour encoder board. For those Atom owners with a colour encoder board, read "WHITE" as "YELLOW", "BLACK" as "BLUE" etc. For those Atom owners with no "F.P." extension, conversion should be easy: remove all "COLOUR" statements, replace "CLEAR 3" with "CLEAR 2", and re-

RUNS ON AN ATOM IN 12K WITH F.P. ROM

RUNS ON AN ATOM IN 12K WITH F.P. ROM

FORMULA ONE FORMULA ONE

BY CHRIS JOHNSON

BY CHRIS JOHNSON

BY CHRIS JOHNSON

BY CHRIS JOHNSON

```

1 XA=0:XB=0:REM FORMULA ONE by C.G. Johnston
2 P.$12"now the same you've been wait'n"
3 P."for" "FROM Cj products..." IB=0
4 F.B=0 TO 120:WAITIN IB=0
5 DOB=8+1:P.$7"++FORMULA one++":U.B=24
6 F.B=1 TO 50:WAITIN IP.
$12"
7 P." YOU ARE DRIVING A CAR AROUND
A RACING TRACK."
8 P." THE OBJECT OF THE GAME IS
TO "SURVIVE THE ROST "
9 P."NO. OF LAPS."
10 P." " "SHIFT"
=LEFT" " "REPT."=RIGHT"
11 IN."COLOUR OF CAR:WHITE:BLACK:2"

```

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12 IF T=1 R=2
13 IF T=2 P=1
14 P."PRESS 'SHIFT' WHEN YOU'VE FOUND
THE CIRCUIT YOU WANT"
15 P."THEN PRESS SPACE TO START RACE."
16 P."press return"ILI.$FFE3
17 DO
18 CLEAR3
19 Q=0:S=110=0
20 COLOUR(R)
21 REM the course
22 H=A.R.X(65-40)+(40-1)+3
23 J=A.R.X(94-70)+70
24 K=A.R.X(110-(1+70))+1
25 L=A.R.X(60-20)+20
26 MOVE 1-1

```



place "%A" and "%B" with an array.

The car does not flip round immediately, but moves diagonally and then flips. Release the key once you have "flipped" to prevent the steering from locking.

Go wide coming up to corners and cut the corners as fine as possible. Watch the car does not tilt too soon (in the oil patch for example).

For a fast time keep the car

following the best racing line to snatch the quickest time around the track for the maximum possible time. Remember it is the maximum number of laps and then the quickest time in that lap zone which counts.

"SHIFT" moves the car left and "REPT" moves it right.

VARIABLES:

%A: most number of laps

%B: quickest time in zone

A: If A = 1 blank car

B, C: key press counters

D: counter

E, F, G, N: values in keypress

H, I, J, K, L: RND course values

O: time

Q: number of laps

R: colour of circuit

S: lap counter

T: colour of car

U, V, W, Z — "PLOT" function

X, Y: co-ordinates of car

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```
70 DRAW L,H:DRAW I,H:DRAW I,J
72 DRAW K,J:DRAW K,(H+5):DRAW L25,(H+5)
73 DRAW L25,10:DRAW L,10:DRAW L,11:DRAW I,11
74 REM inside boundary
75 MOVE 15,23
77 DRAW 15,(H-17):DRAW(I+15),(H-17)
79 DRAW(I+15),(J-17):DRAW(K-17),(J-17)
81 DRAW(K-17),(H-7):DRAW 108,(H-7)
83 DRAW 108,27:DRAW(L+27),27
85 DRAW(L+27),23
87 DRAW 15,23
89 REM start line
90 GOS.t
93 X=(K-50):Y=(J-B)
95 REM -11 51:CK
```

```
96 GOS.e
101 COLOUR (T)
145 F.U=0 TO 28:WAIT N.
150 U,#8001:#S0=0
200 LINK#FFES
299 REM "left + right" movement
300 Z=13:U=12:V=51:W=15:A=1:B=1:C=1
E=#001:F=#002:G=#40
301 N=#80
350#PLOTU,(X-2),(Y+2):PLOTU,(X-2),
(Y-2):PLOTU,(X-1),(Y+3)
350#PLOTU,(X-1),(Y-3):PLOTU,X,(Y+1):
PLOTU,X,(Y-1)
570#PLOTU,(X+1),(Y+2):PLOTU,(X+1),(Y-2):
PLOTU,(X+2),(Y+1)
```





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```

580 PLOTV, (X+2), (Y-1); PLOTW, X, Y
794 GOS, z
955 IF#1 A=2;Z=15;V=7;G, a
997 IF#2 A=1;Z=13;V=5
500 IF?F&G=0;Y=Y-2;X=X-2;B=B+1;C=C-2
510 IF?E&N=0;Y=Y+2;X=X+2;C=C+1;B=B-1
515 IF?F&G(0) AND ?E&N(0);X=X+4;C=C+1;B=B-1
522 IF B=6 G, b
532 IF C=6 G, c
550 G, a
600 REM "top + bottom" movement
610s PLOTU, (X-2), (Y+3); PLOTV, (X+2), (Y+3);
PLOTW, (X-3), (Y+2)
520 PLOTU, (X+3), (Y+2); PLOTU, (X-1), (Y+1);
PLOTV, (X+1), (Y+1)
530 PLOTU, (X-1), Y; PLOTV, (X+1), Y; PLOTW, X, Y
560 PLOTU, (X-2), (Y-1); PLOTV, (X+2), (Y-1);
PLOTU, (X-1), (Y-2)
550 PLOTV, (X+1), (Y-2)
555 GOS, z
650 IF#1 A=2;Z=15;V=7;G, b
570 IF#2 A=1;Z=13;V=5
700 IF?F&G=0;Y=Y-2;X=X-2;B=B+1;C=C-2
710 IF?E&N=0;Y=Y+2;X=X+2;C=C+1;B=B-1
720 IF?F&G(0) AND ?E&N(0);Y=Y+4;C=C+1;B=B-1
730 IFB=6 G, d
740 IFC=6 G, a
750 G, b
800 REM "bottom + top" movement
810c PLOTU, (X-2), (Y-3); PLOTV, (X+2), (Y-3);
PLOTU, (X-3), (Y-2)
820 PLOTU, (X+3), (Y-2); PLOTU, (X-1), (Y-1);
PLOTV, (X+1), (Y-1)
830 PLOTU, (X-1), Y; PLOTV, (X+1), Y; PLOTW, X, Y
840 PLOTU, (X-2), (Y+1); PLOTV, (X+2), (Y+1);
PLOTU, (X-1), (Y+2)
850 GOS, z
860 IF#1 A=2;Z=15;V=7;G, c
870 IF#2 A=1;Z=13;V=5
880 IF?F&G=0;Y=Y+2;X=X+2;B=B+1;C=C-2
895 IF?E&N=0;Y=Y+2;X=X+2;C=C+1;B=B-1
890 IF?F&G(0) AND ?E&N(0);Y=Y+4;C=C+1;B=B-1
895 IFC=6 G, d
897 IFB=6 G, a
898 G, c
900 REM "right + left" movement
950s PLOTU, (X+2), (Y+3); PLOTV, (X+2), (Y-2);
PLOTU, (X+1), (Y+3)
960 PLOTU, (X+1), (Y-3); PLOTU, X, (Y+1);
PLOTV, X, (Y-1)
970 PLOTU, (X-1), (Y+2); PLOTV, (X-1),
(Y-2); PLOTU, (X-2), (Y+1)
980 PLOTV, (X-2), (Y-1); PLOTW, X, Y
994 GOS, z
995 IF#1 A=2;Z=15;V=7;G, d
997 IF#2 A=1;Z=13;V=5
1000 IF?F&G=0;Y=Y+2;X=X-2;B=B+1;C=C-2
1010 IF?E&N=0;Y=Y-2;X=X-2;C=C+1;B=B-1
1015 IF?F&G(0) AND ?E&N(0);X=X-4;C=C+1;B=B-1
1022 IFB=6 G, c
1030 IFC=6 G, b
1040 G, d
2000zREM crash ???
2010 IFX(5) G, y
2020 IF X(1) (L-2) AND Y(14) G, y
2040 IFY(1) (J-6) G, y
2050 IF Y(1) (H-3) AND X(1) (K-3) G, y

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2055 IFV) (H+3) AND X) (K+2) G.y
2060 IF X) 121 G.y
2081 IF V45 G.y
2082 IF V) (H+3) AND X) (I+4) G.y
2085 IF F(X) (K-15) & I(X) (H+3) & V(Y) (H+6) & F(Y)
(H-10) G.y
2088 G.k
2095mF.D=1 TO 5:7F=7F&3100:41N.0=0+1
2095 IF (X) (I) & V(Y) (J-18) & (S=0) Q=Q+155=1
2097 IF F(X) (I5) & S(Y) (Y) 23) S=0
2099 R.
2200 REM *inside* check
2201 IF (X) (I+13) & I(X) (K-13) & V(Y) (J-12) &
(Y) 25) G.y
2204 IFX) 110 G.y
2205 IF (X) (I12) & X) (K-19) & V(Y) (H-3) &
(Y) 23) G.y
2210 IF V) (J-14) G.m
2220 IF X) 114 G.m
2230 IF X) (K-17) AND V) (H-5) G.m
2240 IF X) 185 G.m
2250 IF X) (L+30) AND V) 25 G.m
2260 IF X) (I+16) AND V) (H-17) G.m
2270 IF V) 20 G.m
2280 IF V) (H-14) AND X) (I+14) G.m
2999 REM explosion
9999COLOUR(R)
3001 F.D=1 TO 15:7F=7F&ND:41N.
3020 MOVE X, Y
3030 IF X-3, (Y-3):MOVEX,Y:DRAW (X+7),
(Y-3):MOVE X-3, Y-3
3050 DRAW(X+3), (Y+3):MOVEX,Y
DRAW(X-3), (Y+3)
3060 MOVEX,Y:DRAW(X+4), (Y+5)
3065 F.D=1 TO 20:7F=7F&ND:41N.
3070 MOVE X,Y:DRAW (X-6), (Y+5)
3080 MOVEX,Y:DRAW(X+6), (Y-3)
3090 F.D=1 TO 50:7F=7F&ND:41N.
3999 REM time=most laps
4000 P,412:0=0
4010 P,TIME = "Q"
4020 P,"NUMBER OF LAPS = "Q"
4028 FIFQ=X:I:F:F&S) Q1XB=Q1G.4040
4029 FIFQ=X:G.4040
4030 FIFQ=X:G.4040
4031 XA=Q
4032 XB=Q
4040 P,"MOST NUMBER OF LAPS = "XA" IN "
4050 P,"PRESS RETURN TO START AGAIN"
LI, #F&F3,G.19
5000REM oil slick
5005 GOS,TIME redraw start line
5010 COLOUR 2
5020 F,P=(H+8) TO (H-7) B,-1
5030 MOVEK,P:DRAW(H-17),P
5040 N,P:COLOUR(T)R.
9999 REM SKID
6000 IFB,11F(X) (K-6) G.2090
6005 IFB,XB=0 GOS,s
6010 Y=0
6050F.D=0 TO 180:7F=7F&R.41N.
6060 X=X+(A,R,X:101Y=Y+(R,X:1)R.
7000REM start line
7010 COLOUR(T)MOVEK(X-50), J:F,M=(J-17)
TO (J) S,2
7020 PLOT13, (K-50),MIN,M1R.

```

For the best hardware, the best software.

The BBC Microcomputer system is generally regarded to be the best micro in its price range you can lay your hands on. So, if you're thinking of buying one or already own one, you'll want to know about the software that's been specially designed for it.

Not surprisingly, it's made by Acornsoft, the software division of Acorn Computers Ltd., who designed and built the BBC Microcomputer. So naturally you can expect the highest quality software with the built-in ingenuity to fully exploit the BBC Micro's potential.

Further education for everyone.

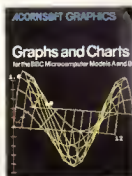
Tree of Knowledge (£9.95) is an interactive program for children of all ages teaching categorisation. It illustrates some of the more practical aspects of computing in that the pupil first educates the computer, building up a database by answering the computer's questions, and the database is then used to play games of deduction and logic.

Word Hunt (£11.90) is a set of four programs, each containing a list of nine words. The object of the exercise is to select one word and then try to create as many smaller words as

possible from the selected word.

Increase your business acumen.

Graphs and Charts (price £17.45) which includes the book 'Graphs and Charts on the BBC Microcomputer' contains a set of programs

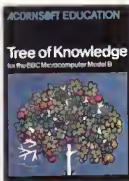


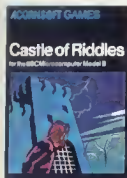
to present data graphically in a wide range of applications. The graphs include automatic scaling, labelling of axes and use of colours.

And VIEW (price £59.80) a program that enables your machine, together with a printer to operate as a fully operational word processor. For convenience the program is in ROM so that it can become a permanent feature of your machine. (It can easily be fitted by your local dealer). You'll find out more by going to your dealer or by sending for the free catalogue.

Mind-hogging games.

Castle of Riddles (price £9.95) is a magical adventure, with wizardry and hocus pocus of all kinds; booby traps and fiendish riddles to be unravelled along the tortuous route to the Magic Ring of Power. Your reward is to keep the





How to get Acornsoft programs.

If you're a credit card holder and would like to buy cassettes of the programs shown in this advertisement, or if you would like to know the address of your nearest stockist, just phone 01-200 0200.

treasure you find along the way.

Meteors (price £9.95) is a game where you have to manoeuvre your laser-ship through a hail of meteors, smashing them with your laser bolts as they loathe towards you on all sides. Complete with sound effects and table of Hi-Scores.

Super Invaders (price £9.95) is a fight against invading aliens. The only way to resist and avoid subsequent annihilation is to destroy the aliens before they land. You have three missile launchers whose hyper-velocity missiles will instantly vaporise their target on impact. This game includes high-score, and is fully compatible with either keyboard or joysticks.

Understanding computers.

Peeko-Computer (price £9.95) simulates the operation of a simplified microcomputer in order to teach the fundamentals of machine-code programming. It comes complete with a 16 page instruction manual including exercises and examples, and the cassette features five demonstration Peeko-Computer programs.

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You control a snake with a big appetite. For numbers. But only the right numbers. He's a bit of a gourmet this snake, he'll only eat the numbers 0, 1, 2, 3, 4, 5 and 6. If he eats a 7, 8 or 9 then he'll suffer a fatal case of food poisoning. You'll also come to a sticky end if you run into the wall of the number patch — or if you start eating your own tail!

Full instructions are included in the program as an aid to your eating habits. We hope it all adds up to a good game! Bon Appetite!

```

100 PRINT "YOU'VE WON"
110 REM ***** GET UP VARIABLES *****
120 LET A=0: LET B=0: LET C=0: LET D=0: LET E=0: LET F=0: LET G=0: LET H=0: LET I=0: LET J=0: LET K=0: LET L=0: LET M=0: LET N=0: LET O=0: LET P=0: LET Q=0: LET R=0: LET S=0: LET T=0: LET U=0: LET V=0: LET W=0: LET X=0: LET Y=0: LET Z=0: LET AA=0: LET AB=0: LET AC=0: LET AD=0: LET AE=0: LET AF=0: LET AG=0: LET AH=0: LET AI=0: LET AJ=0: LET AK=0: LET AL=0: LET AM=0: LET AN=0: LET AO=0: LET AP=0: LET AQ=0: LET AR=0: LET AS=0: LET AT=0: LET AU=0: LET AV=0: LET AW=0: LET AX=0: LET AY=0: LET AZ=0: LET BA=0: LET BB=0: LET BC=0: LET BD=0: LET BE=0: LET BF=0: LET BG=0: LET BH=0: LET BI=0: LET BJ=0: LET BK=0: LET BL=0: LET BM=0: LET BN=0: LET BO=0: LET BP=0: LET BQ=0: LET BR=0: LET BS=0: LET BT=0: LET BU=0: LET BV=0: LET BW=0: LET BX=0: LET BY=0: LET BZ=0: LET CA=0: LET CB=0: LET CC=0: LET CD=0: LET CE=0: LET CF=0: LET CG=0: LET CH=0: LET CI=0: LET CJ=0: LET CK=0: LET CL=0: LET CM=0: LET CN=0: LET CO=0: LET CP=0: LET CQ=0: LET CR=0: LET CS=0: LET CT=0: LET CU=0: LET CV=0: LET CW=0: LET CX=0: LET CY=0: LET CZ=0: LET DA=0: LET DB=0: LET DC=0: LET DD=0: LET DE=0: LET DF=0: LET DG=0: LET DH=0: LET DI=0: LET DJ=0: LET DK=0: LET DL=0: LET DM=0: LET DN=0: LET DO=0: LET DP=0: LET DQ=0: LET DR=0: LET DS=0: LET DT=0: LET DU=0: LET DV=0: LET DW=0: LET DX=0: LET DY=0: LET DZ=0: LET EA=0: LET EB=0: LET EC=0: LET ED=0: LET EE=0: LET EF=0: LET EG=0: LET EH=0: LET EI=0: LET EJ=0: LET EK=0: LET EL=0: LET EM=0: LET EN=0: LET EO=0: LET EP=0: LET EQ=0: LET ER=0: LET ES=0: LET ET=0: LET EU=0: LET EV=0: LET EW=0: LET EX=0: LET EY=0: LET EZ=0: LET FA=0: LET FB=0: LET FC=0: LET FD=0: LET FE=0: LET FF=0: LET FG=0: LET FH=0: LET FI=0: LET FJ=0: LET FK=0: LET FL=0: LET FM=0: LET FN=0: LET FO=0: LET FP=0: LET FQ=0: LET FR=0: LET FS=0: LET FT=0: LET FU=0: LET FV=0: LET FW=0: LET FX=0: LET FY=0: LET FZ=0: LET GA=0: LET GB=0: LET GC=0: LET GD=0: LET GE=0: LET GF=0: LET GG=0: LET GH=0: LET GI=0: LET GJ=0: LET GK=0: LET GL=0: LET GM=0: LET GN=0: LET GO=0: LET GP=0: LET GQ=0: LET GR=0: LET GS=0: LET GT=0: LET GU=0: LET GV=0: LET GW=0: LET GX=0: LET GY=0: LET GZ=0: LET HA=0: LET HB=0: LET HC=0: LET HD=0: LET HE=0: LET HF=0: LET HG=0: LET HH=0: LET HI=0: LET HJ=0: LET HK=0: LET HL=0: LET HM=0: LET HN=0: LET HO=0: LET HP=0: LET HQ=0: LET HR=0: LET HS=0: LET HT=0: LET HU=0: LET HV=0: LET HW=0: LET HX=0: LET HY=0: LET HZ=0: LET IA=0: LET IB=0: LET IC=0: LET ID=0: LET IE=0: LET IF=0: LET IG=0: LET IH=0: LET II=0: LET IJ=0: LET IK=0: LET IL=0: LET IM=0: LET IN=0: LET IO=0: LET IP=0: LET IQ=0: LET IR=0: LET IS=0: LET IT=0: LET IU=0: LET IV=0: LET IW=0: LET IX=0: LET IY=0: LET IZ=0: LET JA=0: LET JB=0: LET JC=0: LET JD=0: LET JE=0: LET JF=0: LET JG=0: LET JH=0: LET JI=0: LET JJ=0: LET JK=0: LET JL=0: LET JM=0: LET JN=0: LET JO=0: LET JP=0: LET JQ=0: LET JR=0: LET JS=0: LET JT=0: LET JU=0: LET JV=0: LET JW=0: LET JX=0: LET JY=0: LET JZ=0: LET KA=0: LET KB=0: LET KC=0: LET KD=0: LET KE=0: LET KF=0: LET KG=0: LET KH=0: LET KI=0: LET KJ=0: LET KK=0: LET KL=0: LET KM=0: LET KN=0: LET KO=0: LET KP=0: LET KQ=0: LET KR=0: LET KS=0: LET KT=0: LET KU=0: LET KV=0: LET KW=0: LET KX=0: LET KY=0: LET KZ=0: LET LA=0: LET LB=0: LET LC=0: LET LD=0: LET LE=0: LET LF=0: LET LG=0: LET LH=0: LET LI=0: LET LJ=0: LET LK=0: LET LL=0: LET LM=0: LET LN=0: LET LO=0: LET LP=0: LET LQ=0: LET LR=0: LET LS=0: LET LT=0: LET LU=0: LET LV=0: LET LW=0: LET LX=0: LET LY=0: LET LZ=0: LET MA=0: LET MB=0: LET MC=0: LET MD=0: LET ME=0: LET MF=0: LET MG=0: LET MH=0: LET MI=0: LET MJ=0: LET MK=0: LET ML=0: LET MM=0: LET MN=0: LET MO=0: LET MP=0: LET MQ=0: LET MR=0: LET MS=0: LET MT=0: LET MU=0: LET MV=0: LET MW=0: LET MX=0: LET MY=0: LET MZ=0: LET NA=0: LET NB=0: LET NC=0: LET ND=0: LET NE=0: LET NF=0: LET NG=0: LET NH=0: LET NI=0: LET NJ=0: LET NK=0: LET NL=0: LET NM=0: LET NN=0: LET NO=0: LET NP=0: LET NQ=0: LET NR=0: LET NS=0: LET NT=0: LET NU=0: LET NV=0: LET NW=0: LET NX=0: LET NY=0: LET NZ=0: LET OA=0: LET OB=0: LET OC=0: LET OD=0: LET OE=0: LET OF=0: LET OG=0: LET OH=0: LET OI=0: LET OJ=0: LET OK=0: LET OL=0: LET OM=0: LET ON=0: LET OO=0: LET OP=0: LET OQ=0: LET OR=0: LET OS=0: LET OT=0: LET OU=0: LET OV=0: LET OW=0: LET OX=0: LET OY=0: LET OZ=0: LET PA=0: LET PB=0: LET PC=0: LET PD=0: LET PE=0: LET PF=0: LET PG=0: LET PH=0: LET PI=0: LET PJ=0: LET PK=0: LET PL=0: LET PM=0: LET PN=0: LET PO=0: LET PP=0: LET PQ=0: LET PR=0: LET PS=0: LET PT=0: LET PU=0: LET PV=0: LET PW=0: LET PX=0: LET PY=0: LET PZ=0: LET QA=0: LET QB=0: LET QC=0: LET QD=0: LET QE=0: LET QF=0: LET QG=0: LET QH=0: LET QI=0: LET QJ=0: LET QK=0: LET QL=0: LET QM=0: LET QN=0: LET QO=0: LET QP=0: LET QQ=0: LET QR=0: LET QS=0: LET QT=0: LET QU=0: LET QV=0: LET QW=0: LET QX=0: LET QY=0: LET QZ=0: LET RA=0: LET RB=0: LET RC=0: LET RD=0: LET RE=0: LET RF=0: LET RG=0: LET RH=0: LET RI=0: LET RJ=0: LET RK=0: LET RL=0: LET RM=0: LET RN=0: LET RO=0: LET RP=0: LET RQ=0: LET RR=0: LET RS=0: LET RT=0: LET RU=0: LET RV=0: LET RW=0: LET RX=0: LET RY=0: LET RZ=0: LET SA=0: LET SB=0: LET SC=0: LET SD=0: LET SE=0: LET SF=0: LET SG=0: LET SH=0: LET SI=0: LET SJ=0: LET SK=0: LET SL=0: LET SM=0: LET SN=0: LET SO=0: LET SP=0: LET SQ=0: LET SR=0: LET SS=0: LET ST=0: LET SU=0: LET SV=0: LET SW=0: LET SX=0: LET SY=0: LET SZ=0: LET TA=0: LET TB=0: LET TC=0: LET TD=0: LET TE=0: LET TF=0: LET TG=0: LET TH=0: LET TI=0: LET TJ=0: LET TK=0: LET TL=0: LET TM=0: LET TN=0: LET TO=0: LET TP=0: LET TQ=0: LET TR=0: LET TS=0: LET TT=0: LET TU=0: LET TV=0: LET TW=0: LET TX=0: LET TY=0: LET TZ=0: LET UA=0: LET UB=0: LET UC=0: LET UD=0: LET UE=0: LET UF=0: LET UG=0: LET UH=0: LET UI=0: LET UJ=0: LET UK=0: LET UL=0: LET UM=0: LET UN=0: LET UO=0: LET UP=0: LET UQ=0: LET UR=0: LET US=0: LET UT=0: LET UY=0: LET UZ=0: LET VA=0: LET VB=0: LET VC=0: LET VD=0: LET VE=0: LET VF=0: LET VG=0: LET VH=0: LET VI=0: LET VJ=0: LET VK=0: LET VL=0: LET VM=0: LET VN=0: LET VO=0: LET VP=0: LET VQ=0: LET VR=0: LET VS=0: LET VT=0: LET VU=0: LET VV=0: LET VW=0: LET VX=0: LET VY=0: LET VZ=0: LET WA=0: LET WB=0: LET WC=0: LET WD=0: LET WE=0: LET WF=0: LET WG=0: LET WH=0: LET WI=0: LET WJ=0: LET WK=0: LET WL=0: LET WM=0: LET WN=0: LET WO=0: LET WP=0: LET WQ=0: LET WR=0: LET WS=0: LET WT=0: LET WU=0: LET WV=0: LET WW=0: LET WX=0: LET WY=0: LET WZ=0: LET XA=0: LET XB=0: LET XC=0: LET XD=0: LET XE=0: LET XF=0: LET XG=0: LET XH=0: LET XI=0: LET XJ=0: LET XK=0: LET XL=0: LET XM=0: LET XN=0: LET XO=0: LET XP=0: LET XQ=0: LET XR=0: LET XS=0: LET XT=0: LET XU=0: LET XV=0: LET XW=0: LET XX=0: LET XY=0: LET XZ=0: LET YA=0: LET YB=0: LET YC=0: LET YD=0: LET YE=0: LET YF=0: LET YG=0: LET YH=0: LET YI=0: LET YJ=0: LET YK=0: LET YL=0: LET YM=0: LET YN=0: LET YO=0: LET YP=0: LET YQ=0: LET YR=0: LET YS=0: LET YT=0: LET YU=0: LET YV=0: LET YW=0: LET YX=0: LET YY=0: LET YZ=0: LET ZA=0: LET ZB=0: LET ZC=0: LET ZD=0: LET ZE=0: LET ZF=0: LET ZG=0: LET ZH=0: LET ZI=0: LET ZJ=0: LET ZK=0: LET ZL=0: LET ZM=0: LET ZN=0: LET ZO=0: LET ZP=0: LET ZQ=0: LET ZR=0: LET ZS=0: LET ZT=0: LET ZU=0: LET ZV=0: LET ZW=0: LET ZX=0: LET ZY=0: LET ZZ=0:

```

RUNS ON A PET IN 4K





Illustration: Dennis Cross

```

5  LEFT X$=""
6  LET T=0
7  GOSUB 4000
10  CLS
11  PRINT " "
20  PRINT " "
30  PRINT " "
40  PRINT " "
50  PRINT " "
60  PRINT " "
70  PRINT " "
80  PRINT " "
90  PRINT " "
100 PRINT " "
110 PRINT " "
120 PRINT " "
130 PRINT " "
140 PRINT " "
150 PRINT " "
160 PRINT " "
170 PRINT " "
180 PRINT " "
190 PRINT " "
200 PRINT " "
210 PRINT " "
220 PRINT " "
230 LET A=PEEK 16396+256*PEEK 1
235 IF 120-2 THEN GOSUB 5000
240 LET A=A+541
250 LET T$=INKEY$
251 IF T$<>" " AND T$<>"0" AND T
252 THEN LET X$=T$
255 POKE A,0
260 IF X$=0 THEN LET A=A+1
270 IF X$=7 THEN LET A=A+33
280 IF X$=5 THEN LET A=A+33
290 IF X$="5" THEN LET A=A-1
300 IF PEEK A=134 THEN GOTO 200
305 LET T=T+1
310 IF PEEK A=126 THEN GOTO 700
315 IF PEEK A=8 THEN GOTO 6000
320 IF X$="7" OR X$="6" THEN FO
KE A,45
325 IF X$=0 OR X$="5" THEN PO
KE A,16
326 IF INKEY$="P" THEN LET X$=
326 IF X$="" THEN POKE A,45

```

PROGRAM NOTES:

11-229: Print track
250-330: Main loop
700-880: Crash display
890-930: Prompt user with "Another go?"
1000-1260: Spectacular start display
1270: Makes the computer pause
2000-2140: Finish the course alive display
3000-3060: Prints "CHEAT" if user goes backwards over the start line
4800-4250: Prompt user with "Enter Level"
5000-5040: Print random oil slicks on the track (level 2 only)
6000-6140: Print "SKID!" if you hit an oil slick
9000-9020: Save the program so that it can run automatically on loading.

VARIABLES:

XS — Direction car is travelling (5, 6, 7 or 6)
T — Time
A — Position of car in D-FILE
LEV — Level (1 or 2)
TS — Key being pressed
X — Multi purpose variable used all through the program
G — Pause (only used in line #70)
Y — COS (32 X) — used as a pause
Z1 — Random position of oil slick (Z1 ÷ D-FILE)
Z — Number of oil slicks (line 5000 — FOR NEXT loop)
SS — "ODDGEN". Print SS would give "ODDGE", because it is used for SAVING the program.

Rev-up your sleek black racer for a challenging time-trial. All you have to do is guide your car around the circuit in the fastest possible time.

To make the challenge harder the author has built in two skill levels.

The first simply asks you to negotiate the twists and turns of the circuit, but the second introduces an oil slick hazard, which you must avoid at all costs!

The slicks appear at random positions on the screen and if you hit one the computer will

flash up a SKID! message.

Your car is represented by an 'T' when it is going left or right, and an 'H' going up or down. Control keys are '5'-left, '6'-down, 'T'-up, '8'-right and '0'-stop. When the car is moving it will continue in that

direction until another key is pressed.

When this program has been entered, to save it on to cassette, type 'GOTO 9000'. This way it will run automatically on loading, and will print out the spectacular starting display.

RUNS ON A SINCLAIR ZX81 IN 4K

DODGEMS

BY MATTHEW WILKES

```

330 GOTO 250
700 PRINT AT 0,0,
705 FAST
110 FOR X=0 TO 6
720 PRINT AT X,15,"I"
730 PRINT AT X,(X+2),"H"
740 PRINT AT X,(29-X),"H"
750 NEXT X
760 PRINT
770 PRINT TAB 4,"          "
780 PRINT TAB 4,"          "
790 PRINT TAB 4,"          "
800 PRINT TAB 4,"          "
810 PRINT TAB 4,"          "
820 FOR X=14 TO 21
830 PRINT AT X,15,"I"
840 PRINT AT X,(22-X),"H"
850 PRINT AT X,(X+9),"H"
860 NEXT X
865 SLOW
867 POKE A,CODE "5"
870 FOR G=1 TO 100
880 NEXT G
890 PRINT AT 21,0,"DO YOU WANT
ANOTHER GO?"
900 IF INKEY$="" THEN GOTO 910
910 IF INKEY$="Y" THEN RUN
915 IF INKEY$="N" THEN GOTO 940
920 LET X=0
930 GOTO 910
940 CLS

```

```

950 PRINT AT 10,10,"STOPPED"
960 STOP
1000 CLS
1010 PRINT
1020 PRINT
1030 PRINT
1040 PRINT
1050 PRINT
1060 PRINT
1070 PRINT
1080 PRINT
1090 PRINT
1100 PRINT
1110 PRINT
1120 PRINT
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```

1205 IF INKEY$=CHR$ 118 THEN RUN
1210 PRINT AT 21,6+X,R5(X)
1220 LET Y=INT (COS (32/X))
1225 NEXT X
1230 PRINT AT 21,7,"PRESS ANY KEY"
1240 FOR X=1 TO 10
1245 IF INKEY$=CHR$ 118 THEN RUN

1250 NEXT X
1255 PRINT AT 21,7," "
1260 FOR X=1 TO 5
1265 NEXT X
1270 GOTO 1190
1280 IF X<>"5" THEN GOTO 3000
1290 CLS
1300 PRINT "000 0 0 0 0 0 0"
1310 PRINT "0 0 0 0 0 0 0"
1320 PRINT "0 0 0 0 0 0 0"
1330 PRINT "0 0 0 0 0 0 0"
1340 PRINT "0 0 0 0 0 0 0"
1350 PRINT "0 0 0 0 0 0 0"
1360 PRINT "000 0 0 0 0 0"
1370 PRINT " "
1380 PRINT "YOU MADE IT ALIVE,"
1390 PRINT "I AM SURPRISED."
1400 PRINT
1410 PRINT "YOUR TIME = ";T
1420 GOTO 890
1430 PRINT AT 8,0
1440 PRINT "CCCC N H EEEEE"
1450 PRINT "O"
1460 PRINT "C H H E A"
1470 PRINT "T O"
1480 PRINT "C NHMMH EEE A"
1490 PRINT "T O"
1500 PRINT "C H H E A"
1510 PRINT "CCCC H H EEEEE A"
1520 PRINT "T O"
1530 GOTO 890
1540 CLS
1550 PRINT "EEEE N N TTTT EE"
1560 PRINT "EEE RRRR"
1570 PRINT "E NN N T E"
1580 PRINT "EEE N N N T EE"
1590 PRINT "E RRRR"
1600 PRINT "E N NN T E"
1610 PRINT "E N N T E"
1620 PRINT "EEEE N N T EE"
1630 PRINT "R"
1640 PRINT "EEE R"
1650 PRINT "L EEEEE U U EE"
1660 PRINT "L"

```

```

4090 PRINT "L E U U E
4100 PRINT "L EEE U U EE
4110 PRINT "L E U U E
4120 PRINT "L E U E
4130 PRINT "LLLL EEEEE U EE
4140 PRINT "L LLLL
4150 PRINT "1 = NORHRL TRCK,"
4160 PRINT
4170 PRINT "2 = OIL SLICKS."
4180 PRINT
4190 PRINT "LEVEL = ";
4200 INPUT LEV
4210 IF LEV<>1 AND LEV<>2 THEN G
4220 GOTO 4990
4230 PRINT LEV
4240 PRINT
4250 PRINT "PRESS ANY KEY TO STA
4260 RT GRM."
4270 IF INKEY$="" THEN GOTO 4240
4280 RETURN
4290 FOR Z=1 TO INT (RND*10)+10
4300 LET Z1=INT (RND*700)
4310 IF PEEK (R+Z1)=0 THEN POKE
4320 R,Z1
4330 NEXT Z
4340 RETURN
4350 CLS
4360 PRINT "SSS K K IIIII DO
4370 PRINT "S K K I D
4380 PRINT "S K K I D
4390 PRINT "S K K I D
4400 PRINT "S S K K I D
4410 PRINT "S S K K I D
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5100 PRINT "S S K K I D
5110 PRINT "S S K K I D
5120 PRINT "S S K K I D
5130 PRINT "S S K K I D
5140 GOTO 890
5150 LET S$="DODGEN"
5160 SAVE S$
5170 RUN 1000

```

CHOPLIFTER



The game that is taking the States by storm is now available for the VIC-20, CHOPLIFTER. Another fine game distributed by Audiogenic.

CHOPLIFTER

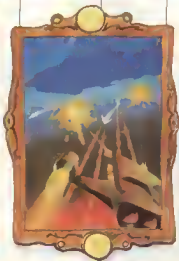
Cartridge-based VIC 20 game £24.95 (inclusive p & p and VAT)
Available from Audiogenic Ltd, PO Box 88 Reading, Berks
(0734) 586334, or from the nationwide dealer network

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EVERY ONE A



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ALIEN DROPOUT



CYBER RATS



SLIPPERY SID



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* A must for serious collectors

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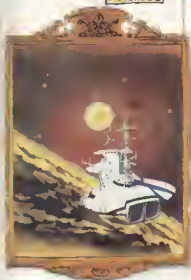
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I know we've had some weird and wonderful games tucked away with in the pages of Computer and Video Games — but this one just about tops the lot.

It's the ideal pastime for those of you who like talking about your illnesses, or trips to hospital, or visits to the doctor... that sort of stuff. In fact you could call this *C&V*'s contribution to the health of the nation.

You may not believe it, but here's a hriof rundown of what you'll get if you feed this into your Vic. Are you sitting comfortably? Then I'll begin. You are sitting in a doctor's

```

1 PRINT "POKE 65536,53
2 PRINT "WELCOME TO DR.VIC'S M SURGERY,PLEASE MAKE YOURSELF COMFORTABLE"
3 PRINT "AND TELL HIM YOUR PROBLEM"
5 POKE 65536,15 V9=76876
10 GOSUB 300
10 L2=M2 B2="" PRINT "X"
40 GETHS IFH8=""THENPOKEV9,8 GOTO40
50 V9=SC(M2) IFV9=17ORV9=20V9B2=""THEN40
60 POKEV9,INT(RND(8)*88)+131
60 IFV9=13THENPRINT "M" GOTO10
70 PRINTH8 IFV9=20THENB2=LEFT$(B2,LEN(B2)-1) GOTO40
80 IFV9=44THENM2=""
90 IFV9=39THENB2=B2+H8
100 GOTO40
110 H8=B2+"" " L2=LEN(H8) POKEV9,8 IFH8=""GOTO130
120 PRINT "TIME UP!!"
125 GOTO1000
130 IFL20THENPRINT "WHY T YOU SAY LONG FENTECES!" PRINT "PLEASE EXPLAIN!" GOTO30
140 IFH8=""THENPRINT "WHY ARE YOU REPEATING YOURSELF?" GOTO30
160 FORJ=1TOE T8(J)="" NEXT JY0 Z=1 F9=1:10L
170 IFH8(H8 J)="" THENY0+1 T8J=H8(H8 J)=Z+1
80 NEXT J
90 FORJ=1TOR H8=H8(J) FORJ=1TOR T8=T8(J)
100 IFH8=H8THEN=J1 J1=J1+1 GOTO20
110 POKEV9,INT(RND(8)*100)+131
120 IFH8(H8 J)=H8(J) THENJ1=J1+1
130 NEXT J1
140 H8=H8+J1
150 IFV9=30
160 PRINT "I UNDERSTAND" PRINT "PLEASE CONTINUE" GOTO30
170 IFH8=""GOTO1000
180 IFH8=""GOTO1000

```

Dr. Vic

RUNS ON AN UNEXPANDED VIC-20

BY L. BRAIN





TANK BATTLE

B | 32K FOR TWO PLAYERS

BY J. WHITING

This is a version of that well known arcade armour-battle — one of the very first video games.

The object of the game is to destroy your opponents' tank — which is prowling the battlefield looking out for a chance to do the same to you!

You can alter the appearance of the battlefield each time you play by selecting the number of trees you want, from 1-200, and you can also introduce a new twist — or more accurately a curve — into the game.

By selecting the option at the start of each game

you can add a nice curve to the path of your shells fired at the enemy.

Another option available to tank commanders is the exploding tree feature! Well, all that really happens is that trees blow up should a shell hit them...

What makes this game

a testing challenge is that you can take on an opponent on equal terms and not have to battle with the superior intelligence of the computer.

Full instructions are included in the program, which provides a real challenge to would-be Field-Marshal's.

The thinking magazine for adventure gamers is here.

From a minor hobby, adventure gaming in Britain has now grown into a major enthusiast activity with players of all ages enjoying the drama, excitement and interest that it provides.

Launching this month, the new **IMAGINE™** magazine will provide not only a comprehensive reference point but also a dynamic introduction to the adventure gaming world.

IMAGINE™ magazine is a must for all gaming enthusiasts as a means of keeping in touch with their specialist field.

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- * New game scenarios and 'brief encounters' for you to introduce into your own game campaigns
- * Aids and supportive information for all types of adventure game systems
- * News and reviews on games introductions and activities within the hobby in Britain, the USA and around the world
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- * A running diary of forthcoming events

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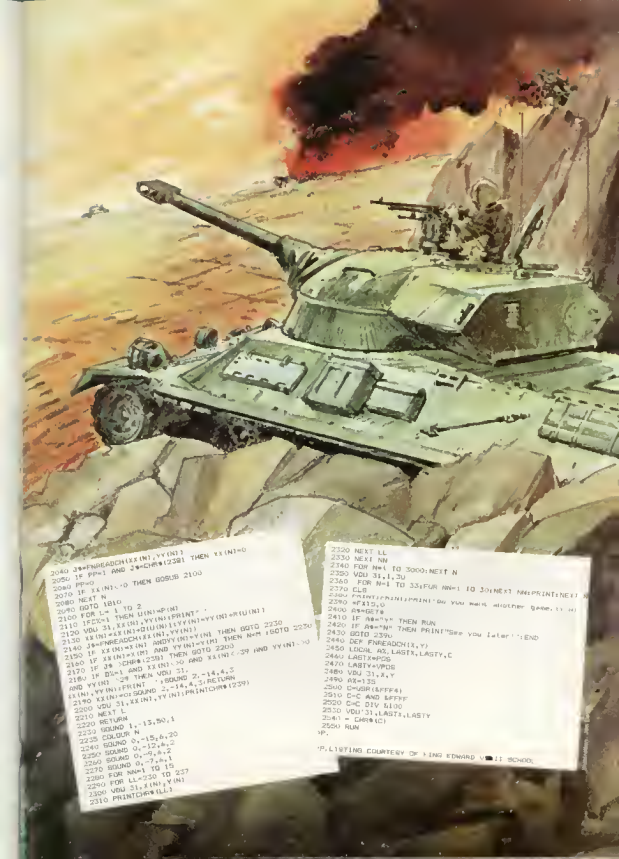
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```

2040 J$=FNREADCH(X$(IN),Y$(IN))
2050 IF PP=1 AND J$=CHR$(123) THEN X$(IN)=0
2060 PP=0
2070 IF X$(IN)=0 THEN GOSUB 2100
2080 NEXT N
2090 GOTO 1810
2100 FOR L=1 TO 2
2110 IF C=L THEN U$(IN)=INT
2120 VDU 31,X$(IN),Y$(IN),PRINT*
2130 X$(IN)=X$(IN)+U$(IN)+V$(IN) THEN GOTO 2230
2140 J$=FNREADCH(X$(IN),Y$(IN))
2150 IF X$(IN)=X$(IN) AND Y$(IN)=Y$(IN) THEN N=M:GOTO 2250
2160 IF X$(IN)=X$(IN) AND Y$(IN)=Y$(IN) THEN GOTO 2200
2170 IF J$=CHR$(123) THEN GOTO 2200 AND X$(IN)+39 AND Y$(IN)+3
2180 IF D$=1 AND X$(IN)=0 THEN VDU 31,
AND Y$(IN)=29 THEN VDU 31,
X$(IN),Y$(IN),PRINT* : SOUND 2,-14,4,3
2190 X$(IN)=0: SOUND 2,-14,4,3: RETURN
2200 VDU 31,X$(IN),Y$(IN),PRINTCHR$(123)
2210 NEXT L
2220 RETURN
2230 SOUND 1,-13,50,1
2235 SOUND N
2240 SOUND 0,-15,6,20
2245 SOUND 0,-12,6,2
2250 SOUND 0,-9,6,2
2255 SOUND 0,-7,6,1
2260 SOUND 0,-7,6,1
2265 SOUND 0,-7,6,1
2270 SOUND 0,-7,6,1
2275 SOUND 0,-7,6,1
2280 FOR LL=250 TO 257
2290 FOR LL=250 TO 257
2300 VDU 31,X$(IN),Y$(IN)
2310 PRINTCHR$(LL)

```

```

2320 NEXT LL
2330 NEXT NN
2340 FOR N=1 TO 3000: NEXT N
2350 VDU 31,1,30
2360 FOR N=1 TO 33: FOR NN=1 TO 33: NEXT NN: PRINT: NEXT N
2370 CLS
2380 PRINT: PRINT: PRINT: "Do you want another game, Y/N?"
2390 IF A$="Y" THEN RUN
2400 IF A$="N" THEN PRINT: "See you later!" : END
2410 GOTO 2390
2420 DEF FNREADCH(X,Y)
2430 LOCAL AX,LASTX,LASTY,C
2440 LASTX=X
2450 LASTY=Y
2460 VDU 31,X,Y
2470 AX=135
2480 C=USR(A$)
2490 C=C AND 15
2500 C=C AND 15
2510 C=C AND 15
2520 C=C AND 15
2530 VDU 31,LASTX,LASTY
2540 = CHR$(C)
2550 RUN
2560

```

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BBC, DRAGON & ATARI GAMES FROM QUICKSILVA

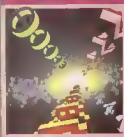
DRAGON MINED-OUT

On Screen Features: Thrilling Mines, Dangerous Business, Mine detection and color 9 levels of minefield, Safe area, Progressive difficulty, Scoring, High score
Controls: Full instructions, Up/Down-Left, Right
Special Features: Bill the Worm, Buge (mines with legs), Mine Spreaders, Action Replay
Author: **Ian Andrew**

ATARI 400/800 MAGIC WINDOW

Define characters on 8x8 grid. Save to tape. Load from tape. Freely merges character sets into existing programs. Hex & Dec Q/Ps. Character manipulation. Mirror rotates invert left right up down hold wipe cancel. Redefine whole character set. Also works in colour mode. Excellent examples supplied. 16K RAM or more.
Author: **M. Walker**

MAGIC WINDOW FOR THE ATARI 400/800 FROM QUICKSILVA



CHARACTER MANIPULATOR
WITH FULL KEYBOARD CONTROL

As part of the plan to expand their software cover all the most popular personal computers QUICKSILVA are proud to introduce 3 new programs for the BBC Computer, plus a version of their popular "MINED-OUT" game for the Dragon and also a character generating program for the Atari 400/800 "MAGIC WINDOW"

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Explores your BBC music potential to its limits.
Features: Full push button operation over 30 separate functions for recording, mixing, editing and sound effects etc. 4 channels, 5 potencies, 100 000 envelopes easily selected. Over 2000 note storage capacity. Ready made music files included.
Author: **Andy Williams**
For model A or B

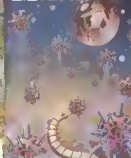
PROTECTOR

Features: Fend monsters who kill on contact, mine laying UFO, a monster's increase in size as game progresses, new pods every 1000 pts., hyperspace function. Full colour hi-res graphics, sound. Joystick control.
For the model B with 16K + Joystick.
Author: **Andy Green**

WIZARD

The lands most beautiful maidens are being sacrificed by an evil King. Can you be their saviour fighting off hordes of evil demons armed only with your wand and magical powers. A most complete and original game with hi-res colour graphics and full sound.
Author: **A. R. Buckley**
For the model B with 32K

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VIC20
+ JOYSTICK

TORNADO: In the midst of the Colony Wars ships are attacking you from the air you have three types of ground base to bomb. Features: Full Colour, Hi-Res Graphics, Sound, Ironsawing, Speed, High Booms, Progressive Difficulty, Random Landscape, Explosions. By Chertec for the unexpanded VIC20 + Joystick.

PIXEL GAMES

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A cut-throat strategy game to reap valuable booties around the planet Delta. Hi-Res Graphics and lots of fun for two to four players. For the unexpanded VIC20.

STARQUEST/ ENCOUNTER

A voyage of discovery and adventure in the cosmos. With the help of your onboard computer you seek a habitable planet amidst the perils of deep space. For the VIC20 + 16K RAM.

QUICKSILVA are proud to introduce Skyhawk written by Chertec for the VIC20 personal computer, many more amazing games to come!

SKYHAWK: Features Multi-colour, Hi-Res 3-D Effect, Graphics, Realistic Sordling Landscapes, Aircraft Landing and Refueling, Radar and Aircraft Status Displays, High Booms, River, Full Sound Effects, Varying Formations of Attacking Aircraft, Extra Life, etc 3000 pts, Fuel Low Warning, Realistic Explosions. For the VIC20 + 3K or 8K expansion + Joystick.

PIXEL POWER



VIC20 8 OR 16K
To create new-definite characters
in your own programs.

PIXEL

PIXEL POWER

A graphics workshop packed with useful features such as Create, Amend, Save and View. For the VIC20 with 8K or more added RAM.

SUBSPACE STRIKER & ZOR

It comes from out of nowhere and then vanishes back into the ether. With your deadly antimer torpedoes, you unleash havoc in the Federation's Spieships.

For the
VIC20 +
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HARVESTER



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A Cut-Throat game of Strategy & Fun
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TRADER

A trilogy of 16K programs that combine to give an epic 48K graphic adventure. As a galactic trader, you deal with some very bizarre customers indeed. Will you live to tell this tale? Supplied in a box with extensive instruction booklet.

STARQUEST



VIC20 16K GAME
A voyage of Adventure and Discovery
Plus ENCOUNTER to Game

PIXEL



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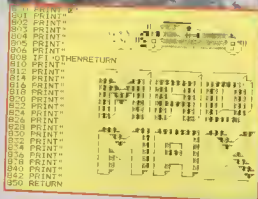
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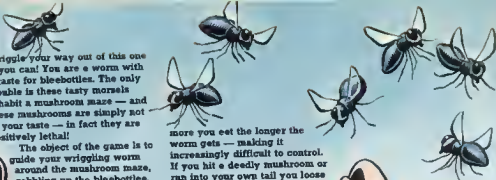
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It's the programs that make micros magic.

It means you can use it for games and for learning (anything from simple programming to a foreign language).

You can use it in the home for everything from household budgets to planning a touring holiday abroad or remembering

birthdays and important anniversaries. And if you run your own business then a micro could totally transform it for you.

Our range of programs cover Games, Household, Education and Business. We've shown just a few titles above,

come and browse round the rest at Micropoint.



A company associated with Unicom Ltd. Please ask for further details. APRIL 20th 1984. If you pay by Bank or Credit Card, we will accept orders by post.

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The object of this game is to fly a spacecraft into a deep, steep-sided cavern and land it at the bottom. Stray spaceships and jagged rocks will get in your way, and you only have a limited amount of fuel. But this can be replenished by docking with the red fuel dumps you come across on your way down into the pit. The controls are simple. 'I' to move left and 'O' to go right. Happy landings!

BY M. WOODMAN



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GHOSTS' REVENGE

Ghosts of the world anit! You have nothing to lose but your Pacmen! We've put up with that horrible little creature for long enough. It's time we fought back — and I've got a plan to beat him. All we have to do is get rid of those sneaky little power pills in the corners of our maze that will fix the little hlihter. OK lads, let's get to it!

This just had to happen. A poor little Pacman trapped in this maze with a ravenous ghost chasing him — and not a power pill in sight! This is a joystick controlled game for two players. One takes the part of the poor little Pacman, the other becomes the hungry ghost out for a quick snack.

RUNS ON A DRAGON IN 32K

BY GARETH JONES

The Pacman in represented by the red square, which rooves around the maze gobbling up dots for points. Minnwhin the ghost chases after him & represented by a black square. The difficulty of the game depends on the skill of your opponent!

The Main variable are:

A: The position of the black square

B: The position of the red square

S: Score

U: Last score

MS: A blue square that makes up the maze walls

TS: A white square that makes up the maze passages

I have poked the moving graphics on the screen instead of using print @. The addresses are in the range of 1924 to 1535




```

100 U=0
110 M=CHR$(175)
120 T=CHR$(207)
130 CLS
140 PRINT "=====
150 PRINT "THE LEFT JOYSTICK CONTROLS THE RED SQUARE AND THE RIGHT
160 PRINT "THE LEFT JOYSTICK CONTROLS THE BLACK SQUARE, THE AIM OF THE GAME FOR THE BLACK SQUARE
170 PRINT "IS TO CATCH THE RED SQUARE, AND THE RED SQUARE CHINS A POINT EVERY TIME IT
180 PRINT "

```

```

190 PRINT "PRESS A JOYSTICK BUTTON"
200 F=PEEK(65280) IF P=125 OR P=253 OR P=126 OR P=254 THEN 170
210 GOTO 150
220 PLAY "T100CDEFGABCDEFIABCFGHBCDEFGAB"
230 CLS
240 A=1328
250 B=1200
260 REM PRINT MAZE
270 PRINT "
280 PRINT "
290 PRINT "
300 PRINT "
310 PRINT "
320 PRINT "
330 PRINT "
340 PRINT "
350 PRINT "
360 PRINT "
370 PRINT "
380 PRINT "
390 PRINT "
400 PRINT "
410 PRINT "
420 PRINT "
430 PRINT "
440 PRINT "
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460 PRINT "
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810 PRINT "
820 PRINT "
830 PRINT "
840 PRINT "
850 PRINT "
860 PRINT "
870 PRINT "
880 PRINT "
890 PRINT "
900 PRINT "
910 PRINT "
920 PRINT "
930 PRINT "
940 PRINT "
950 PRINT "
960 PRINT "
970 PRINT "
980 PRINT "
990 PRINT "

```

```

400 REM CHECK IF RED SQUARE IS CAUGHT
410 IF PEEK(A)=191 THEN 700
420 IF PEEK(B)=128 THEN 700
430
440
450 REM READ JOYSTICKS AND UPDATE DISPLAY
460

```

```

470 IF JOYSTK(0)=63 AND PEEK(A)=191 THEN A=A-1 POKE A-1,207 PLAY "04L255"
480 IF JOYSTK(0)=63 AND PEEK(A)=128 THEN A=A+1 POKE A+1,207 PLAY "04L255"
490 IF JOYSTK(1)=63 AND PEEK(A+32)>175 THEN A=A+1 POKE A+1,207 PLAY "04L255"
500 IF JOYSTK(1)=63 AND PEEK(A+32)<175 THEN A=A-1 POKE A-1,207 PLAY "04L255"
510 IF A=1279 AND JOYSTK(0)=63 THEN A=A-1 POKE A-1,207 PLAY "04L255"
520 IF A=1279 AND JOYSTK(0)=63 THEN A=A+1 POKE A+1,207 PLAY "04L255"
530 IF A=1279 AND JOYSTK(1)=63 THEN A=A-1 POKE A-1,207 PLAY "04L255"
540 IF A=1279 AND JOYSTK(1)=63 THEN A=A+1 POKE A+1,207 PLAY "04L255"
550 IF PEEK(A)=191 THEN 700
560 IF PEEK(A)=128 THEN 700
570 IF PEEK(B)=128 THEN 700
580 IF JOYSTK(2)=63 AND PEEK(B-1)>175 THEN B=B-1 POKE B-1,207 PLAY "05L255"
590 IF JOYSTK(2)=63 AND PEEK(B-1)<175 THEN B=B+1 POKE B+1,207 PLAY "05L255"
600 IF JOYSTK(3)=63 AND PEEK(B+32)>175 THEN B=B-32 POKE B-32,207 PLAY "05L255"
610 IF JOYSTK(3)=63 AND PEEK(B+32)<175 THEN B=B+32 POKE B+32,207 PLAY "05L255"

```

```

520 IF PEEK(A)=191 THEN 700
530 IF PEEK(B)=128 THEN 700
540 PRINT "SCORE: ", S, " 1 UP: ", U
550 POKE A, 128
560 POKE B, 191
570 GOTO 470
580 REM RED SQUARE CHUGHT
590 PLAY "I6L3BLUAL3GL3FL3EL3DL1"
600
610 U=0
620 CLS PRINT "THE RED SQUARE'S SCORE: ", S, " 1 UP: ", U
630 FOR A=1 TO 1000 NEXT
640
650 REM PLAY AGAIN
660 PRINT "PRESS A JOYSTICK BUTTON"
670 F=PEEK(65280) IF P=125 OR P=253 OR P=126 OR P=254 THEN 800
680 GOTO 700
690 GOTO 100
700
710
720
730
740
750
760
770
780
790
800
810
820
830
840
850
860
870
880
890
900
910
920
930
940
950
960
970
980
990

```



....Introducing the AGF JOYSTICK INTERFACE II for

Sinclair ZX Spectrum 81

ABOUT OUR JOYSTICK INTERFACE

Following in the footsteps of our extremely popular original interface, which has sold over 1,000 worldwide since October last year, we have improved its performance.

The Interface Module II has been specially designed to plug on to the rear connector of your ZX Spectrum or ZX81 and allow you to connect any standard Atari type digital Joysticks. All of the computer's connections are duplicated on an extension connector so that you can still use any other devices intended for use with your computer. The Interface Module II resides in the same memory space as the keyboard, which remains fully functional at all times, therefore it will not interfere with anything else connected.

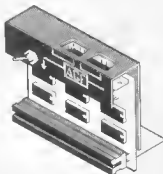
When a suitable joystick is plugged into 'Player 1' socket its action will mimic pressing the cursor keys, up, down, left, right and so on. The firing button will simulate key 6. The unique feature gun/missiles the best software support.

Take a look at the selection of compatible games we have listed. More are being added all the time as a result of our contact with the various software companies.

A second joystick may be connected in the 'Player 2' position which simulates in a parallel fashion keys T Y U-I-P. This will allow you to play a whole new generation of two player games.

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Using joystick control in your own programs is as easy as reading keys. Eight directions and Fire are all read by simple BASIC. With every order there comes a free demonstration program called 'Video Graffiti' plus a full set of instructions.



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- Proven cursor key simulation for maximum software support
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- Second Joystick facility
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- Rear extension connector for all other add-ons
- Free demo program, 'Video Graffiti' + full instructions

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ZX SPECTRUM

Abersoft	Mazeman
Axis	Labyrinth
Campbell Systems	Gulpmen
DK Tronics	<input type="checkbox"/> 3D Tank £4.95
	Meteroids
ICL	Star Trek (Man, Dock)
New Generation	<input type="checkbox"/> Escape £4.95
Software	<input type="checkbox"/> 3D Tunnel £5.95
Pison	* Flight Simulation
	VU-3D
Silversoft	Ground Attack
	<input type="checkbox"/> Cyber Race £5.95

ZX81

Artic	Galaxians
J.K. Greys	3D Monster Maze
P.S.S.	Krazy Kong
	Ghost Hunt
	Maze Drag Race
	Asteroids

Silversoft

- NB ☐ Available from us, please tick
* Not suitable for original interface

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	INTERFACE MODULE II	20.95	
	JOYSTICK(S)	7.54	
	SOFTWARE AS TICKED ON LIST		
	SOFTWARE AS TICKED ON LIST		
ZX81 <input type="checkbox"/>	ZX SPECTRUM <input type="checkbox"/>	Please tick	FINAL TOTAL

DEALER ENQUIRIES WELCOME

EXPORT PRICES ON APPLICATION

GRAPHICS

By Garry Marshall

TALK TO ME IN 3D!

The importance of graphics is being realised in more and more areas. And the need for good graphics utilities which make their creation comparatively simple is being met.

The graphics commands that are included in many micro-computer dialects of Basic do allow any graphics display to be created.

But just as no businessman would be advised to write his own stock control program in Basic, so he would not be advised to write his own graphics programs using the graphics commands available in Basic.

In the same way as general-purpose stock control programs can be purchased, so general purpose graphics utilities are beginning to become readily available.

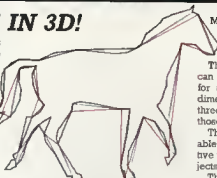
Having purchased a commercial package, for whatever purpose, the user has only to learn how to use that package, as opposed to learning all the skills that are needed for programming.

Additional advantages include the provision of good documentation and the support that is provided with professionally produced software.

A prime example of the increasing importance being attached to the provision of graphics utilities is provided by the new Apple LISA.

This machine provides its user with a suite of programs, including a word processor and a database.

The user can use any program in the suite with equal ease, and can



swap from one to another at will.

However, what is particularly interesting is that the suite contains not one, but two graphics programs.

This demonstrates clearly how important the role of graphics on such a system is considered.

The graphics programs can be used to generate charts and graphs of various kinds using data held by any program in the suite.

Special-purpose graphics languages have been used for a long time with mainframe computers.

They provide systematic ways of generating particular types of graphics that are simple to use.

They also provide some portability for graphics programs, in total contrast to the situation in micro-computer graphics where graphics programs written for one micro will seldom if ever run on another machine.

One graphics package that was originally developed for use on mainframe computers and which is now available for micros is GINO-F. It can be used with the Research

Machines' RM380Z. It is, in fact, a library of sub-routines, with each sub-routine providing some graphics capability.

The capabilities that it provides can be grouped broadly into those for administration, those for two-dimensional drawing, those for three-dimensional drawing and those for interaction.

This package is particularly valuable for the production of perspective views of three-dimensional objects.

The three-dimensional drawing commands are natural generalisations of the two-dimensional commands that are familiar to everyone. This makes the programming of perspective views particularly easy, and removes the need for any mathematical knowledge.

The accompanying illustrations show what can be accomplished with the aid of a suitable package with very short programs.

The package is called PICASO. It is not available for micros, although there is no reason why it should not be.

PICASO was developed by John Vince at Middlesex Polytechnic. It is intended for users with a minimum of programming skill, and was originally intended for use by artists and designers.

It provides a library of shapes and a variety of means for manipulating them.

The illustrations produced by PICASO reproduced here illustrate the point that a good graphics utility can be a remarkably good aid to any kind of graphics programming.



THE INVASION HAS BEGUN

The assault on your senses has begun with a great choice of games that have been created to give you a real challenge!

ARCADIA

SCHIZOID

..the name
of the game

The names of these games
are already created to be the best
more obscure word you can find
you've ever heard. The word
you'll come and find out
follows immediately after the
English word. The word you
on the first page of the
21st page of the
1000th page of the
book.

...the most
...of the most
...your space
...you have
...in three

2X Spectrum (16K or 48K)
100% machine code with 12 different alien types,
playable music, multiple graphics and animation, narrow
playfield and resonant sound effects.
Keyboard or joystick.

VC-20 (easy memory save)
100% machine code with eight different alien types,
playable music, multiple graphics and animation, narrow
playfield and resonant sound effects.
Game design and software by D. H. Lawton.

for any ZX SPECTRUM.

It's my own loss, I even volunteered.
I thought it was easy using the space-dancer and isohedral and isohedral
Chris play. I didn't know I was using the galaxy's ribbon.
the way, the code, and all the rest.
for they didn't say I'd have to top and control not just one but two
or even more garbage pods. Then you then, push
black, and so slowly, so empty.
Panic, main panic, but they won't stop hitting and
ignoring and turning, always turning towards me, against
me, at me, and I'm alone.
No way out, nowhere to hide, on my own my own... own...
SCHIZOIDS: NOT JUST A GAME, BUT A STATE OF MIND.
Exhilarating visual experience, slow sound and all those arcade
features you'd expect from IMAGINE.
Game design and software by Jim Forreard and
the Yid Kids (D.H.L.)

the widest, zaniest way of winning a
few bucks. With crazy puns screaming for
you to pick up the pace, don't stop the action,
as you dodge the debris and all
don't stop the action to slither out if the Boss
can spot you, you gotta be
wonderful animation, super smooth code,
multiple graphics, atmospheric
sound effects and special playfield.
Keyboard or joystick control.
Yet another high performance
game for the ZX Spectrum.
for any Commodore
Game design and
software by
Eugene Evans.



WATCH OUT FOR THEM...

catcha snatcha



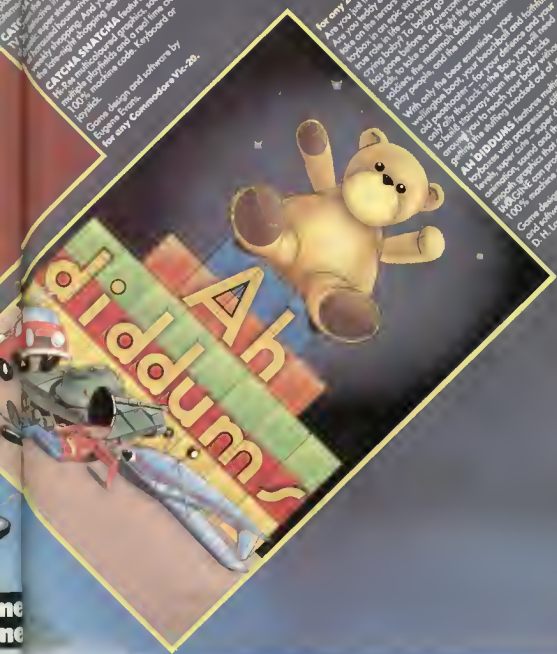
Barney
boobies
had never had
it so bad, demoted
from one director of
the antiquity to the
level of a men's store
detective he wanted his
nose well worn back
considering his predicament
life for the hardened criminal
he has to look after his
valuable underwear. Of
lost property officers
as a player
exciting A
Carnegie
The
Carnegie
Carnegie

Imagine

..the name
of the game

and the
entirety of a
commentary on a topic
and often times when
the host's hands are to the
viewer. Of course, one can
also enjoy the long shopping
sessions to add to the fun and

CATCH-A-SNATCHA brings to your TV screen the mad, mad world of the
famous super store ever built with voracious
wildly shopping. And you just wait till
the cat-night shopping starts.
CATCH-A-SNATCHA features smooth
multi-colored graphics, sound,
multiple playfields and a real time clock.
100% machine code. Keyboard or
joystick.
Game design and software by
Eugene Evans.
for any Commodore VIC-20.



for any ZX-SPECTRUM.
Are you just the average laddy.
Are you laddy enough to
take on the terror of the
topov in an epic struggle to
true role in life—to reach and comfort your
crying baby? To boldly go where no laddy
has gone before. To overcome incredible
odds, to solve on and fight the clockwork
police, the mammoth doll, the train set, the
play people, and the murderous pianist.

With only the bear assembly—your
willingness to be, your bearish and hostile
old postmaster—for your defense and your
only ally, the Jack in the box, you will need
to build trainways from the play bricks
erecting the shifting landscape out of you.
WHODUNNIT features multiple
playfields with progressive difficulty
levels, super cues—super detailed
animation, sound and those real
smooth graphics that only
WHODUNNIT can produce.
100% machine code.
Game design
and software by
D.H. Lawson.

THERE IS NO ESCAPE

FRANTIC
for any VIC-20

escape and mine the
many rooms of spectrum.
To research and destroy the
many alien life forms present.
METHOD: GEO-GRANTATIONAL
MINING.

Your voice shows a deadly
view, a head laser of speed
towards the cases of the
piled through for the
with only a minimum
withhold the game
The above is a
which you can
the game for
the game for
the game for
the game for

Any of these games for just

£5.50
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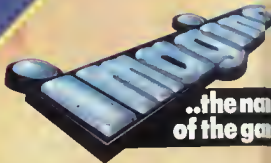
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...and a tube of Imagic's bookpaste of your
...temp the DX. Head off by and avoid a painful
...and our warning and now he's suffering the
...DI's even more evil.
...I had better stop writing all that is
...try to clean them if you
...sics from your teeth over
...Hobbs, Y
...at

...in machine code. Making
...and experience of colour
...format graphics unique to him.
...the design and software
...John Gibson.



CVGS





SECRETS OF THE SPIES

An Adventure can cover almost any storyline providing there is excitement.

This is where the use of "special condition" lines can be used.

Supposing our theme is a spy story and, briefly, part of the plot runs like this: The player has obtained some microfilm from a dead-letter box unknowingly watched by the opposition.

His next hurdle is to flee the country, but must first get hold of his passport, taken from him during an earlier encounter with the opposition. The position of the player is:

Inventory: REVOLVER — object no.1
I.e. P(1)=50 MICROFILM — object no.2
I.e. P(2)=50

Location: DARK ALLEY — loc'n no.10 I.e. LN=10

Exit: EAST. Destination = DIM BACK STREET (loc'n no.9) WEST. Destination = GUARDED WALL (loc'n no.11)

BY KEITH CAMPBELL

Therefore ES(10)="EW" and DS(10)="X911"

The story line of our sub-plot is to go like this: If carrying the microfilm in location 9 the player will see a suspicious stranger lurking (object no.3).

After five moves in this location the stranger will disappear into an unseen opening leading to location 12, which was not visible or accessible before.

If he follows, the player will get killed. But after three more moves, the stranger will re-appear. He will shoot the player after another three moves if not shot first.

If the stranger is shot before he enters the opening, that exit will never be available.

To program this, the stranger must appear as if from nowhere when the current location is the dark alley and object 3 is in the player's inventory.

"Nowhere" will be created by in-

habiting the location of object 3 as a 88, a non-existent location.

Let us set up a count of visits to the location using the stranger's flag, C(3) which for reasons to be explained later will always be negative, initially -2. Therefore we must count negatively:

110 IF P(2)=50 AND LN=9 THEN LET C(3)=C(3)-1; LET P(3)=9

Now we must count five moves in this location before he disappears into the opening for three moves. This will be when C(3)=-7, -8, or -9

120 IF C(3)=-8 AND C(3)>-10 THEN LET P(3)=12

We must comment on his disappearance and open up the new exit to location 12:

130 IF C(3)=-7 THEN LET Q25="STRANGER HAS DISAPPEARED"; LET LS(9)=LS(9)+1; NARROW OPENING IN WALL"; LET ES(9)=ES(9)+0; LET DS(9)=DS(9)+12"

To make him re-appear:

140 IF C(3)=-10 THEN LET Q25="STRANGER'S BACK"; LET P(3)=9

There is no need to re-assign his location, as it was set at 9 in line 110. Now he must shoot you if C(3)=-12:

150 IF C(3)=-12 THEN .(go to suitable end of game message)

What we have not covered is the eventuality of the player entering location 12 while the stranger is there. Suppose we want the player shot, then we can adapt line 150 by inserting:

150 IF (LN=12 AND P(3)=12) OR C(3)=-12 THEN ...

But what if the player shoots the stranger? If this is done before he reveals the opening, he must be made to disappear forever in our SHOOT verb routine, to say location 99. Remembering that he started life at location 88, we must now amend line 110 to read:

110 IF P(2)=50 AND LN=9 AND P(3)<99 THEN

Thus our count of moves will only operate whilst the stranger is alive, and the player is carrying the microfilm in location 9.

A final extra touch might be to provide for dropping the microfilm in location 9, when the stranger will snatch it and disappear. Using the above conventions and variables, see if you can write the necessary line!

THE MAGIC OF FROBOZZ...

Two adventuring colleagues of mine who have access to a PDP-11 have been playing Dungeon from DECUS during their lunch breaks for the past 9 months.

They invited me over to join in, but I could see there was no chance I'd be allowed to lay a finger on the keyboard!

Before them lay a map almost a metre square, painstakingly built up during their exploration of this very large adventure land.

They told me they had recently discovered how to operate the skulka gates, and successfully drain a reservoir. They were currently at the bottom of a dry well and the problem under discussion was how they might get out upwards, for they were sure there must be an exit that way.

"It's a magic well, so we must be able to do something pretty useful here. The most useful thing for us right now is to go up," explained Ian.

How did they know it was magic? "It's a FROBDOZZ well, and all FROBDOZZ products are magic", he replied. Well, of course!

Suddenly their concentration went back to the screen. A lean and hungry

gentleman had just entered their vicinity, and without care on their part was likely to rob them blind.

I left them to it, wondering anxiously whether I could afford a PDP-11.

Some weeks later I had a disc drive fitted to my TRS-80 and looking around for a disc Adventure, came across Zork.

I was intrigued and amused by the replies, some of which were over a screenful of text!

Indeed, the game has commands VERBDOSE BRIEF and SUPERBRIEF to limit those screenfuls if you are going through a part of the game you have already played.

Zork turns out to be Dungeon. It is available for 32k Atari from Callisto Computers, and 32k TRS-80 from Tandy. Both machines must have at least one drive.

I haven't yet drained a reservoir, or even found the magic well, but I've been places that my friends haven't even heard of. That's how big it is!

I wonder how many readers are currently playing this game in one of its forms?

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(16K) See Appendix



Graphic Adventure (8K)

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HIRE AND FIRE!

In our quest for the cheaper way to play we found that rental prices vary tremendously — but an average price to aim for is around 50p-a-day for a top-of-the-range game like Star Raiders or Pacman.

Hardware units are also offered for hire by some of the high street television rental shops.

Radio Rentals were the first people to start hiring video games a year ago when they offered the Intellivision for hire. You can get one for £5.95 a month, or £4.95 if you already rent a television from Radio Rentals. For the price you get the Master Component and a soccer cartridge, plus one other cartridge of your choice.

Radio Rentals policy on the games cartridges themselves has always been to sell rather than hire — but this is likely to change if a scheme currently being tried out in the North West proves successful. In certain shops in the region the firm is hiring out the Mattel range of games on a weekly or daily basis.

If you don't have a Radio Rentals shop near you then you may also be able to rent games from your local video-films hire shop. Almost every high street now has a video shop and many newsagents stock them as well.



A typical scheme is operated by Easy Video Limited at their three shops in the London area. You can hire a top of the range game for 50p a day. Games which are cheaper to buy are also cheaper to hire. These go down to about 20p a day.

Hardware units come considerably dearer at between £5 and £7 a week.

Son Dosaj of Easy Video said the main advantage of hiring a cartridge was that it gave you an opportunity to give the game a thorough testing in your own home before you decide to buy. There must be at least one game in your collection which seemed like a good buy at the time but after the first couple of weeks hardly ever gets played. Hiring should enable you to tell whether a game stands up to the two-week test.

Your local public library may also soon be stocking video games for hire. Surrey Library Department now has video games for hire in seven of its branches. They offer the complete range of Atari VCS cartridges, with Imagic and Activision titles shortly to be added to the list.

During the 18 months the scheme has been running it has been an enormous success. The demand for games has



Playing up video games is great fun — but it can cost a bomb to save the universe!

With the best new games retailing at anything up to £30 Computer and Video Games decided to take a look at a cheaper way of playing video games. And we found that the key to cost saving may be found at your local video hire shops, where among the films you may find video cartridges available for rent.

been so great that the proceeds have recouped the initial outlay and the scheme is now self-financing.

The chief librarian of Surrey Library Services Mr Douglas Betts, told C&VG that people often queue up to wait for games to be returned so that they can hire them.

Surrey charge 50p per week and you can hire up to four games at a time using your library tickets in the same way as you would to borrow books.

There has been some criticism of video games in the library, although Mr Betts says he has been able to counter this with the many advantages of the scheme.

The games attract young people into the library and they may learn to appreciate the other services offered.

It also provides a small revenue for the library, and is the first step towards the "library of the future" which will provide educational and instructional software not only for video games units, but also for home computers and video recorders.

Technology is also cutting the costs of playing games.

In the US you can play a game using a telephone link in a similar way that microcomputer owners can get access to games, via Prestel, and the new Micronet 800 system in the UK.

The American system is based on a

BY EUGENE LACEY

special adaptor which is supplied by the telephone company. This takes a signal down the telephone cable to your home which is then converted into a games program for your Atari VCS or Intellivision.

The charge for the game is then made at the end of the month when you receive your telephone bill.

Although hire is not as popular in the US as it is here, one nationwide hotel chain is offering its guests a ColecoVision and cartridges to hire for the duration of their stay.

If your local library doesn't stock video games and you don't have a local video films hire shop, there are a number of hire by mail firms now offering competitive schemes on video games.

Just £10 will buy you a life membership of the hire club run by E&E



Enterprises of Cornwall.

You then pay 25p a day hire and there is no extra charge for postage and packing.

E&E stock the entire range of games for the Atari VCS, Mattel Intellivision, Acetronic, and Philips G7000 machines. They buy their games direct from the wholesaler so that as soon as the games are in the shops they are also available for hire from E&E.

As official buyers for the Video Traders Association, Easy Video are also offering a hire service to individual shops who can then hire the games out to their customers.

Games Galore, a Slough based firm, offers a range of games for the Atari.

An annual fee of £40 enables you to borrow the games at no extra charge.

So if you want to play all the latest video games without breaking the bank the best advice C&VG can give is hire and fire folks!

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TRY THIS TRICK SWITCH

Visitors to Mahlda the witch's house, after negotiating the tricky landing among the chimney stacks and finding a safe spot to drop in by, find life inside just as complicated.

Mahlda is always trying to rearrange her cumbersome furniture — so large that only one item at a time will fit into each tiny room.

Spells are of no help — in fact they led to the present disorder. What is needed is a solid spot of weightlifting.

Only one object can be moved at a time into the only empty room. Each room is connected to the room next door on the same level and, by stairs, to the room immediately above or below it.

The problem is that the clock must change rooms with the book and the cauldron needs to be where the bed is and vice versa. The setee is already in the right place.

What is the least number of times the objects must be moved to achieve Mahlda's aim?

Labelled counters or paper squares can be placed on our picture and pushed around to simulate the removal men.

You can record your effort by noting the one empty room after each move is made.

MELTING POT

Mahlda, the wicked witch has, without any great originality, called her house The Cauldrons. As most of her visitors travel by broomstick, the house name is painted, rather decoratively, on the roof.

If you can move from tile to adjacent tile — either straight down or diagonally, just how many different ways are there to spell CAULDRONS?

You can spend most of your holiday trying to count them but there is a much easier way of finding the answer — and perhaps the rest of the tiles on her roof may be of help!

ARCADE GAME ON BOARD

The ACME Spaghetti, Bedding Plants and Interplanetary Travel Co. not being in quite the same league as NASA and the Russians has entered the space race on a microchip scale.

So slow is their first Delta rocket that time, even in zero G, hangs heavy on the hands of the crew. To pass the dayless months away they have taken the headline of the last newspaper the saw before leaving Earth and are attempting to form new words from it.

On each new line one letter must be dropped from those used in the line above and those left must form a new word or words. A word, to be valid, must be of three letters or more and must be a bold type entry from *Chambers Twentieth Century Dictionary*, (revised ed.).

Words must not overlap along the line and must be separated by a bar. A word once used must not be repeated.

BY TREVOR TRURAN



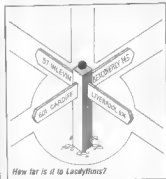
Each line scores the total of all the letter values which appear in it. These values are shown above the top line, so hanging on to your J or your F might be a good idea.

Before finding the grand total by adding up the scores for each line, bonuses can be gained for each word which is of five or more letters. The bonus is one point for each letter in the word; a five-letter word gains five points, a six-letter word six points and so on.

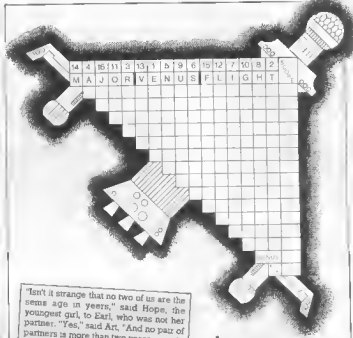
ACME ground control reports that the navigator aboard the spaceship had just recorded a splendid new high score and was about to give the details when the telephone line linking them to Earth finally broke.

The company has therefore decided to extend an invitation to the readers of this magazine to submit their best efforts and has coerced Milton Bradley into donating three of their range of six arcade board games. The range includes Pecman, Frogger, Donkey Kong, Defender, Berzerk and Zaxxon. To enter, send in the diagram, or a copy of it, with your words, score for each row, bonuses claimed and final total to reach us by May 12.

The first three prizewinners highest scoring entries will each receive a prize — provided they remembered to include their name and address! Usual competition rules apply.



terms.)
i.e. numbers are read in conventional
NOTE: CD=400 not 100+500 just as
ms=50+400+1+1=452.
CEROH = 100+500+1=501, LACDYM.
Thus Liverpool = L+IV+L = 104.
numbers which are included within it.
How far? 452 miles. In each word the
distance is equal to the sum of the roman
numerals.
WITCH SWITCH
H
K, H, L, S, D, B, H, K, B, L, H, B, S, L, B, K,
the initial letter of the empty row; L, B,
18 moves. As in this sample, shown by
212. The number of ways of spelling C,
CA, CAU, CAUL, CAUL are the answers have
been listed in as clues.
From filling in the top few lines it will
be apparent that each number is the sum
of the three numbers in the row above.
diagonally to the left.
1 + 1 + 1
1 2 3
1 3 6 + B
1 4 10 47
By completing this table of answers the
four numbers in the final row:
1 9 + 45 = 54.
A further clue is given to the left of the
main letters ABC=F=1, B=2 and



"Isn't it strange that no two of us are the same age in years," said Hope, the youngest girl, to Earl, who was not her partner. "Yes," said Art, "And no pair of partners is more than two years apart in age". Bob is two years older than Hope's partner.

Pluto's partner and Earl are two years apart in age. Charlotte is one year older than Ida. Pluto, while three years older than Hope's partner, is younger than Ida.

Fran's partner and Pluto are four years apart in age. Fran and Bob are four years apart in age.

When you know that Fran is 28-years-old, you can work out the age of Earl, can't you?

By Paul McLennan

Farmer Nur's Blooming Problem in March proved that we don't number many horticulturists among our readership.

Trevor Truran finally managed to outsmart most of you by the convoluted thinking and only two readers entered a correct solution.

Mrs M. Barker of Acreville Close, Kargley in Yorkshire and Alan Northcott of Reading Road, Wokingham, Wokingham discovered the secret of the red, white and blue blooms.

Their reward is a Vulcan Electronics Hungarian Ring to puzzle over. The other eight rings we will hold back for a future competition. Our commiserations go out to all the rest of you who sweated over the problem with a ball-point pen poised.

SOLUTIONS

main letters ABC=F=1, B=2 and
1 9 + 45 = 54.
A further clue is given to the left of the
four numbers in the final row:
1 4 10 47
By completing this table of answers the
four numbers in the final row:
1 9 + 45 = 54.
A further clue is given to the left of the
main letters ABC=F=1, B=2 and

Pluto (22) and Charlotte (24).
Bob (21) and Ida (23).
Earl (28) and Fran (25).
Art (10) and Hope (20).
Their ages are:
Earl is 26 years old. The partners and
CRYPTIC COUPLES
Where N is the number of letters in the
word, gives a general solution.
formula
$$(N+1)(n-2)(N+3) - (n-1)^2$$

4, 9, 10, 32 and work out that the
deduce the result by noting that the
Those mathematically minded may
has further suggest "three".
1+2+3=6 and so on. (The three triang-

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ODD AND EVEN PREJUDICE

Understanding this controversy will improve your, or your computer's, skill. Black seems to have an advantage in the opening, though why is difficult to explain.

Black's first move is forced by symmetry, as A in diagram 1, but all of White's replies (B's) allow Black to play good moves, as defined in the previous article on openings. From then on White has to tread very warily.

Black seems to have more opportunity to remove "safe" moves from White. The end result is that White should be under pressure throughout the game.

Black should try to capitalise on opening gains by aggressively destroying White's "options" (choices of sensible moves). This can mean taking sides more willingly.

White should be frugal with his own options, his aim being to survive to the end-game.

BLACK'S POWER

If you look at the alternative starting position (allowed in Reversi, but not in Othello) as shown in diagram 2, you will find that Black has even more pressure after move C.

White D and Black E are typical replies and reveal the source of Black's power — the odd number of squares in the inner corners (i.e. C, D and E are three squares which is

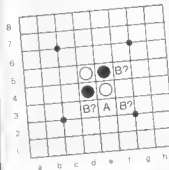


Fig 1

BY JOHN BALL

When playing Othello, also known as Reversi, do you prefer to be Black or White? In all logic games, one side is commonly thought to have a slight advantage, such as White in chess. The world-wide preference for Othello is Black.

According to the International Grapevine, top American and Japanese players are now favouring White. About time, too!

an odd number). White then has to breach the next area.

To understand the Black v. White struggle, you must grasp the concept of "odd" and "even" areas — in other words areas with odd or even numbers of spaces.

SUBTLE DOUBLETS

After the opening, Black comes up against even areas, and has to use his ingenuity to create odd areas.

White on the other hand is happy

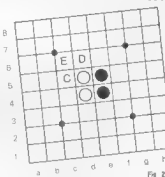


Fig 2

to have even play, due to doublets in the end-game.

These "doublets" are really the final even groups of spaces split up into pairs. Examples are FF, GG and HH shown in diagram 3.

To play in one space would invite your opponent to play in the other paired space.

It is an advantage to be the second player, as it wins you corners or sides. Indeed throughout the game, there are more subtle "doublets".

As Black started, if the end-game

splits up into a series of doublets, then Black will lose each one, assuming that White has the sense to follow Black into each doublet.

From this, a big difference in aims is raised for Black and White.

Black's purpose throughout the game is to make the game odd — by creating odd areas, ideally in which only Black can play. Black

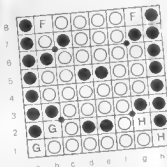


Fig 3

then avoids odd areas unless there are an even number of them. Thus puts White in doublet trouble.

White's purpose throughout the game is to make the game even, by creating even areas, forcing Black into doublet trouble.

Usually the best Black can do is stave off the doublet trouble until the last two or four spaces. If he can keep it odd to the end — a rare event — he has usually won.

So if you are good at surviving early on, you should have more chance of winning as White, now that you know about the even and odd doublet battle.

For four years now, former British champion John Parker and myself have spoken out in favour of White as giving the best opportunities.

According to the international grapevine, top American and the brilliant Japanese players are now switching their allegiance to White as well. And about time too.

Unlike chess, where the large number of opening moves means that the first mover can dictate the way the game develops initially, the first mover in Othello is limited to just four, all causing identical positions.

Are you finding the coding tough? It is always difficult to follow someone else's program, let alone one that has been written on a computer other than your own. The Editor and I are anxious to provide assistance to help you, so if there are any difficult points, please write and let us know.

Machine code is a challenge to convert and, as one reader has pointed out, could mean a complete rewrite.

You will find it helpful to study Ted Ball's series of articles on machine language in this magazine because this compares the code for all the popular chips. Remember, however difficult it may appear, don't give up in despair! Write in and tell us the problem.

I told you in my last article that we had completed a module which would enable you to write several wargames. We must now start to concentrate on the detailed programming for WARPETH and this month I intend explaining the input routine.

Now that the SEARCH routine is included, we can now look at the coding required to move a piece. Intertwined is a routine to test for pieces on HOLD.

You will also see that flags are needed to provide for a man in the FLAG hex and for the man who wants to move without the FLAG.

To assist you, figure 1 is an explanation of every line from 540 to 750. Line 540 controls the whole program.

The main input handling routine is handled by lines 460/470 which will accept any number from 1 to 6 or a character.

Fortunately, the VALUE of a character is zero which is very convenient. Line 480 handles errors; instead of the number of moves, it flickers "HOW".

Line 1230 is a SUBE. This leads into the COMBAT routines which we will start work on next month.

Once you have entered this month's listing, there will not be room for the remainder of the program.

An inspection of the program shows that the DATA statements take up a great deal of space, and as you by now appreciate, these are superfluous once the information is loaded into the strings. I suggest that you work in the following manner:

1. Load your tape containing parts 1 to 4.
2. Type in the listing below.
3. Save on a new tape.
4. Run the program. You will now be able to move the pieces on the map. Try out all the options given in the rules.
5. Once you are satisfied, delete lines 791, 1084, 3000-3150, 6198-6400.

Once you have made these changes you will notice a great improvement in the initialization.

WARPETH

to be continued
next month



Figure 1

- 540 START : Change sides, display number of pieces, check win by elimination.
- 550 PRANGE : Get range of PTABLE index for that side.
- 560 INDEX : Get location of piece, its type and moves.
- 570 : Check HOLD condition — if location is negative, decrease KD — the number of pieces on HOLD.
- 580 DISPLAY : Display WINDOW, Clear "FLAG" flags.
- 590 INPUT : Get character and "Man in FLAG hex" flag. Prepare MV string.
- 600 : Prompt for input. If a number, it's a MOVE, else if previous input was "L", goto INPUT.
- 610 A="L" : If man not in FLAG hex, goto ERROR. Set LF flag, message and goto INDEX.
- 620 A="S" : STOP moving that man — goto FINISH.
- 630 A="C" : CHANGE sides — goto FINISH.
- 640 A="H" : If man has not moved, negate index 0 and increase KD, number of pieces on HOLD — goto NEXT.
- 650 ERROR : Print "HOW" — goto INPUT.
- 660 MOVE : Is hex vacant? If HQ captured, END game. If Hex is not empty, goto ERROR.
- 670 UPDATE : If FLAG has reached fort, END game.
- 680 : Update BOARD, WINDOW, BIGSCREEN and PTABLE.
- 690 : If indians have captured FLAG, END game.
- 700 FINISH : Is man a tomahawk? Not required to stop.
- 710 : Test surrounding hex for opponents.
- 720 If A="C" : Movement complete but check for HOLD.
- 730 If A="S" : Goto next piece.
- 740 : Decrease MV. If moves still available, goto DISPLAY.
- 750 NEXT : Increase piece index. If more pieces to move, goto INDEX.
- 760 : Check for HOLD. If KD greater than zero, goto PRANGE.
- 770 : Combat sequence.
- 780 : Return to line 040.

C & VG SOFTWARE FORM

Have you written a games program which you feel is just right for C&VG? If so we have come up with a form to ensure that we can list it out and give you our views on it, as quickly as possible.

We would prefer a tape and listing but can work from just a tape and will return it to you if it doesn't find its way into the magazine. We will also need an additional sheet explaining the game and its theme. And any documentation like lists of variables or how certain routines are working, would be of great help to beginners.

This form will merely help us to keep a check on your game as it goes through our testing process and make sure we have all the information we need to present it properly in the magazine.

If you don't want to cut up the magazine, we will accept photocopies or close copies of this page. This form will be appearing regularly in C&VG issues from now on.

Remember we pay £10 for each listing published and you could win our Programmer of the Year Contest where we will try to turn the winner into a best-selling games author.

Program name:

Machine
make:

Model

Other models it
should run on:

Number of K
needed to run it:

Other equipment (joysticks, Extended
Basic, add ons, etc.) needed to run it:

Author's Christian
name:

Sur-
name:

Address:

Tel:

Date:

Type of game: (If original
please say so)

Loading instructions:

Game instructions: (If not included
in the listing)

Office use only

Date received:

Evaluator's comments

Acknowledgement sent: ☐

Good enough
to publish ☐

Name of
evaluator:

Needs some
tidying up ☐

Date sent out:

Not worth
publishing ☐

Date due back:

Same game
already published
on this micro ☐

Needs to be returned to
author for alterations: ☐

Date
sent ☐

Due to be published in
issue of magazine. ☐

Wouldn't load ☐



SEVENTH EMPIRE

THE Seventh Empire is dead. Long live the Seventh Empire! By way of an upology to readers who were planning out their next moves, we have to admit that we have had a technical hitch beyond even the Bugs' wildest imaginings.

A combination of a disc-drive error which did not back up our data properly and a power cut which scratched out our current data disc meant that our files on the game are now hopelessly out of date.

Although we can laugh about it now, coming in on press day to find the mess that used to be a flourishing galaxy winking out error messages when it should have been neatly processed and ready to print out the results, almost reduced a half-grown staff-writer to

THE FALL OF AN EMPIRE

tears and had our production editor tearing his hair out.

It was very tempting to write that a previously unmentioned black hole which Mike Singleton had plucked in an uncharted region of the Galaxy had sucked the whole caboodle down its eternal maw.

But we couldn't just leave you all to such a fate. The Seventh Empire is currently being resurrected. We have the technology to rebuild it, better and taster than before. And all your details are still filed away ready to be written back into the program.

The disc drives have been sent out to be repaired and the program discs have, luckily, escaped damage. So we are currently trying to ensure that the

Savonh Empro will rise from the ashes of its former self.

It will mean that we'll have to send out new fleet positions, but we hope that you'll bear with us, put the first three turns down to experience and join in the triumphant re-launch of the Seventh Empire in our next available issue.

A final note: I know a couple of people have phoned up saying that for one reason or another they have had to give up the Seventh Empire commitment. We do have a lot of other readers who would like to take your place in the game, so please phone or write if you would like to opt out of the revitalised Seventh Empire and we will put a new reader into that slot.

A special apology goes out to our last top 10 players in April who were pulling ahead in the race for the Colecovision prize. We will scratch our heads to try and ensure that the new Seventh Empire lakka account of their scores.

But on the positive side, we have learnt a lot about what we were taking on when we launched Seventh Empire and although it is currently a dirty word in the office, the resurrected game will banish it from that knowledge.

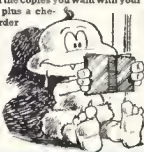
Our thanks go to Psion and Melbourne House for providing the software for our April winner's prize. David Jones has a Spectrum and he chose The Hobbit, Penetrator and Flight Simulation as his reward for trading his way to our top April score.

COMPUTER & VIDEO GAMES BACK ISSUES

Look what you've been missing! Games programs for your favourite machine, news and reviews of those games types you've always wanted to know about, plus special features on the latest trends in the exciting world of computers and gaming.

If you would like to catch up on what's been going on in the pages of Computer and Video Games over the past months why not send off for some back issues? It's easy to do.

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WARE SOFTWARE SOFTWARE SOFT REVIEWS

MIGHTY KONG BEATS OFF ANNOYING BUGS

KRAZY KONG

Take an ape, a blonde stilet and a cute
little carpenter called Mario and you've got
the three vital ingredients of Donkey Kong
one of the latest hit arcade games.

Most video games players will know the
format backwards but for the uninitiated
the plot is a simple one. The ape has
grabbed your girl and taken her to the top
of a steel fortress. You must climb the
fortress and rescue her, avoiding barrels
which the great hairy beast is showering
you with from above.

After the first few attempts at playing
Intercept Micros version (ei the unex-
perienced Vic-20 this game appeared to have
more bugs than a flea bitten old megalomaniac
it took me quite a few games to learn how to
get started.

All the action takes place on one screen
— as opposed to the three screens of the
Nintendo original.

I was disappointed that the ape cannot
be made to crash to the ground as he does
in the arcade version when you reach the
top level. When you get to the top you
simply kiss the girl to rescue her, clock up
a few bonus points, and then you must
start all over again — but at a faster pace.

The bugs mentioned above occur mainly
at the beginning of the game. To get
started you must jump onto an elevator
which takes you to the bottom of the steel
fortress.

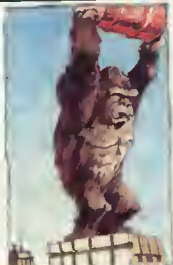
If you jump at the wrong moment you
may find half of your body left behind. Or,
when you do get to the bottom of the
fortress having jumped off the elevator
safely you may find yourself wedged
through the first level instead of walking
along it.

Another thing that could have been im-
proved was the long delay after being hit
by one of the barrels. I found myself
constantly bashing the repeat button in
sheer frustration.

On the graphics side Krazy Kong scores
highly for the inexperienced Vic. The ape and
girl were both believable representations
even if Mario was a little stick like.

Converting Donkey Kong to the inex-
perienced Vic was an ambitious project
which many other software houses have
not attempted. Intercept Micros version
plays a reasonable game despite the odd
bug. It is available from the Tedley, Hents
based firm at £5.95.

- | | |
|-------------------|---|
| ● Getting started | 9 |
| ● Value | 6 |
| ● Playability | 6 |



GIVE THESE GUARDS THE BRUSH OFF!

SUPER GLOOPER

Paint the numerous corridors of a maze
and dodge the aliens. This is the challenge
you face in the new ZX81 game from Psion
called Super Glooper.

There are five different mazes to choose
from, and unlike the numerous Pacman-
type games now on sale, you do not have
to gobble dots, but colour the maze in as
you move the Glooper around.

To make things a little bit more difficult
there are four guards, represented by in-
verse 'A's, who try to catch you.

To help you deal with the guards there
are four shields — represented as 'S's in
the four corners of the maze. When you
paint over these they turn the guards into
inverse 'X's and you can then kill them off.

On the B-side of Super Glooper is a
bonus game based on the popular arcade
game Frogger.

Frogs is based on the second stage of
the arcade version in which you must get
your frog across a river by hopping from
log to log. There are nine levels of play.

Super Glooper and Frogs are available
from most large branches of WH Smith at
£4.95, running on the ZX81 with 16K RAM.

Two good quality machine code games
have got to make this cassette another
winner for Psion.

- | | |
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| ● Getting started | 9 |
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E SOFTWARE SOFTWARE SOFTWARE
REVIEWS

WELL, IT'S A VERY GOOD IDEA, BUT...

SCHIZOIDS

Spectrum Schizoids is one of the best ideas for a game to arrive on the C&V's reviews desk for several weeks.

Yon are at the wheel of an intergalactic Space-Doez charged with the nontrivial task of having to bulldoze refuse from all over the galaxy into a black hole.

Yoni does can be made to thrust forward, rotate left and right and 'flip' — which has the effect of turning the machine instantly through 180 degrees to face in the opposite direction.

The controls for the dozer are very much in the style of asteroids — and indeed the space refuse comes at yon from all four corners of the screen in Asteroids-fashion.

The space debris spews towards you in three dimensional geometric shapes. There are cubes, diamond shapes, hexagons, rectangles and bars and all in different shapes and sizes.

One of the strongest features of Schizoids is the three dimensional movement of the shapes.

The dozer itself is quite difficult to manoeuvre and will take yon a lot of practice to master it.

As yon drift around the screen, diff because the dozer has inertia, you must be careful not to tumble into the black hole yourself.

The black hole has a slight gravitational pull and can suck yon down even if yon don't make contact with any of its spike edges.

The secret of shunting the shapes towards the hole is to make sure yon catch them head on with your shovel. If they touch the side of your vehicle they will explode it.



Despite an excellent idea and clever programming with good graphics, I did feel that the playability of the game left a little to be desired.

It is very difficult to move the pieces of debris and control the dozer at the same time. Furthermore, the debris has a tendency to stick to the dozer's shovel, or get entangled in the skyhook at the rear. With a little bit more care a good idea could have been turned into a really good game. What we are left with is an average game but not quite up to the standard of Arcadia, and not net up to the high standard we have come to expect from Imagine software.

The game runs on a Spectrum in 16 or 48k and is available at £5.50 from the Liverpool-based firm.

- Getting started 9
- Value 8
- Playability 6

RAPID RODENTS WILL RUN YOU RAGGED!

CYBER RATS

Rats, rats, rats! Yes, there will be a lot of cursing in Spectrum owning households once they get their hands on Silversoft's latest release — called Cyber Rats.

Yon are presented with a field full of the "meanest metallic menaces" ever let loose to plague mankind. They dash around the screen swarming down at your extremities. For they can hide behind clumps of grass which block yon's line as they rush down at yon. There's also the deadly purple rats which head downwards faster.

Once yon brush off one wave of the rapid rodents another bunch springs out to do battle. If one catches you at the bottom of the screen it's bye-bye yon off.

Yon can move up and down the screen to fight off the approaching rats as well as left and right — but watch out for sneaky rats catching you unaware in the maze like grass clumps.

This reviewer had to make do with the keyboard control option to play the game but it is also joystick compatible.

The tape loaded first time and comes with a good set of instructions — the only thing that baffled me for about five minutes was the fact that the instructions didn't say which key to use as the "fire" button.

I'm sure that the game would be even better with a joystick.

Cyber Rats comes from Silversoft of London and sells at around £5.

- Getting Started 8
- Value 8
- Playability 8

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"It has great graphics, sound effects, and music. The action is very fast!"
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3-D MAN VIC + 3k, + 8k, + 16k Joystick

Brilliant! You are like Pac-Man down in the maze in three dimensions. Race down the corridors dodging the ghosts and gobbling up the energy dots. Radar screen also provided to guide you around.

"The graphics are extremely fast and superbly done!"
U.S. Compute Magazine Feb. 83 **£9.95**



DEFENDER ON TRI VIC + 3k, + 8k, + 16k Joystick

Race against the clock. Fly your starship through the maze of Tri, an abandoned space station. You must rescue some scientists before the station hits the sun. Activate your shields and conserve your fuel through 4 screen levels.

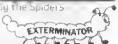
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MACHINE CODE

TERMINOLOGY PROCESSORS

The three processors, 6802, 6809 and 280 have some addressing modes in common, but the terminology differs, and each has some addressing modes that are not available on the others.

6802 Addressing Modes

Implied Addressing: The operand is implicitly specified in the instruction, for example, CLC — clear the carry flag, or INX — increment the number in the X register.

Immediate Addressing: The operand is contained in the instruction, for example LDX # 0 — load the X register with the number 0, or ADC # 2 — add the number in the accumulator, the number 2, and the carry, leaving the answer in the accumulator.

Because all the registers in the 6802 are 8-bits long an immediate operand must be an 8-bit number, 0 to 255 decimal, or 0 to FF hex.

Absolute Addressing: The 16-bit address of the operand is contained in the instruction, for example INC \$1234 — increment the number in memory location \$1234, or STA \$1234 — put the number in the accumulator into memory location \$1234.

Zero Page Addressing: The operand contained in the instruction is an 8-bit address which is an abbreviation for a 16-bit address in the range \$0000 to \$00FF, i.e. an address with high byte 0.

For example, INC \$70 — increment the number in memory location \$0070, or STA \$70 — put the number in the accumulator into memory location \$0070. Zero Page instructions occupy two bytes instead of the three bytes required in absolute addressing and take less time to execute, so by using addresses in Page Zero to store frequently used variables a program can be made significantly shorter and faster.

Accumulator Addressing: The operand is the accumulator, A. This addressing mode is only available with the four instructions ROL A, ROR A, ASL A, LSR A.

Relative Addressing: This is only used with the conditional branch instructions. The operand is a signed 8-bit number which is added to the current address to give the destination address when the branch takes place.

Absolute Indirect Addressing: This may be used only with the jump instruction JMP, and in assembly language this addressing mode is indicated by plac-

An assembly language instruction generally consists of two parts, the operation code (opcode for short), and the operand.

We have looked at several types of instruction, but so far we have been more concerned with what the instructions do (the operands) than with how the processor obtains the numbers to operate on (the operands).

The various forms, by which an operand may be specified are called *addressing modes*, and writing efficient machine code programs requires an understanding of all the addressing modes and the circumstances in which to use them.

Here I explain the workings of the addressing modes of the 6802, 6809 and 280.

ing brackets around the address.

The instruction contains a 16-bit address, and the effective address is contained in the memory location indicated in the instruction and the next higher memory location.

For example, suppose we have \$00 in memory location \$1234 and \$10 in memory location \$1235.

The instruction JMP (\$1234) would then cause the processor to continue execution from address \$1000. Note that, as with all 16-bit addresses on the 6802, the address is stored with the low byte before the high byte.

READING IN MEMORY

Indexed Absolute Addressing: The operand in the instruction is a 16-bit address, and the effective address is obtained by adding the contents of the X or Y register to the address in the instruction.

The assembly language form for the operand is address, X or address, Y.

For example, if the X register contains \$20 the instruction LDA \$1234, X will load the accumulator with the contents of memory location \$1234+\$20=\$1254, and if the Y register contains \$E0 the instruction STA \$1234, Y will put the contents of the accumulator into memory location \$1234+\$E0=\$1314.

This addressing mode allows us to read tables stored in memory by giving the start address for the table in the instruction and varying the X or Y register to access different entries in the table.

Indexed Zero Page Addressing: This works in a similar way to Indexed Abs-

olute Addressing, but requires only an 8-bit Zero Page address.

However, the effective address is always in Page Zero. For example, if the X register contains \$E0 the instruction LDA \$40, X will load the accumulator with the contents of memory location \$0040, not \$0120.

Although Zero Page, X addressing may be used with several instructions, Zero Page, Y addressing can be used only with the opcodes STX and LDX. **Indexed Indirect Addressing (pre-indexing):** This can be used only with the X register. The instruction contains a Page Zero address, and the contents of the X register are added to this Page Zero address (ignoring any carry, so the result is always a Page Zero address), and the effective address is the contents of this new Page Zero address and the next higher address.

The assembly language form for the operand is (address, X). For example, if the X register contains \$E0, address \$0020 contains \$00, and address \$0021 contains \$10, the instruction STA (\$40, X) will store the contents of the accumulator in address \$1000.



Indirect Indexed Addressing (post-indexing): This can be used only with the Y register. The instruction contains a Page Zero address and the effective address is obtained by adding the contents of the Y register to the 16-bit address contained in the specified Page Zero address and the next higher address.

The assembly language form for the operand is (address, Y). For example, if the Y register contains \$E0, address \$0020 contains \$34 and address \$0021 contains \$12, the instruction LDA (\$20, Y) will load the accumulator with the contents of memory location \$1234+\$E0=\$1314.

Note the difference between the last two addressing modes. In indexed indirect addressing the indexing is performed first, and then the indirection, while in indirect indexing the indirection is performed first, and then the indexing.

BY TED BALL

ADDRESSING THE 6809 CHIP

6809 Addressing Modes

Inherent Addressing: The operand is implicitly specified in the opcode, for example, *CLRA* — set the contents of accumulator A to zero, or *ABX* — add contents of accumulator B to contents of Index Register X, leaving the result in X.

Immediate Addressing: The operand is included in the instruction. There are two types of immediate addressing.

In the first type the operand is a constant, for example, *ADDA #320* — add the constant 20 hex to the contents of accumulator A, leaving the result in A, or *LDU #1234* — load User Stack Pointer U with the constant 1234 hex.

The constant must be of the same length as the register specified in the opcode — 8 bits for an 8-bit register or 16-bits for a 16-bit register.

In the second type of immediate addressing the operand is one or more registers, for example, *TFR A, B* — transfer the contents of accumulator A to accumulator B, or *EXG X, Y* — exchange the contents of Index Register X with the contents of Index Register Y.

Extended Addressing: The 16-bit address of the operand is included in the instruction. For example, *LDB \$1234* — load accumulator B with the contents of memory location 1234 hex, or *STX \$1234* — store the contents of Index Register X in memory locations 1234 hex and 1235 hex. 16-bit addresses and data are stored in memory with the high byte first, followed by the low byte, so in the previous example, if X contained \$1000, \$10 would go into address \$1234 and \$00 would go into address \$1235.

Direct Addressing: The low byte of the address of the operand is included in the instruction, and the high byte of the address of the operand is provided from the Direct Page Register, DP.

For example, if DP contains \$00 the instruction *LDA \$34*, will load accumulator A with the contents of address \$0034, while if DP contains \$12, *LDA \$34* will load A with the contents of address \$1234.

A standard 6809 assembler will normally assume that DP contains zero, but this can be changed by using the directive *SETDP*, which takes an immediate operand.

SETDP does not generate a machine code instruction; it is an instruction to the assembler to use direct addressing whenever the high byte of an extended

address is equal to the value given in the *SETDP* directive.

Thus, if we include *SETDP \$12* in an assembly language program, and later have the instruction *LDA \$1234*, the assembler will provide the two byte direct page form of the instruction instead of the three byte extended form.

Instead of using *SETDP* we can cause the assembler to provide a direct page instruction by writing *<* in front of the operand.

Thus, *LDA <\$1234* will produce the two byte direct page instruction. Similarly, writing *>* in front of the operand will cause the assembler to produce the three byte extended form of the instruction.

Thus, if we have not used a *SETDP* directive, *LDA >\$34* will produce a three byte machine code instruction equivalent to *LDA \$0034*, while if we previously had a directive *SETDP \$F0*, *LDA >\$34* will produce a three byte machine code instruction equivalent to *LDA \$F034*.

In order to get a specified value into the Direct Page register we have to use a *TFR* or *EXG* instruction; there is no straightforward load instruction for DP. For example we could write:

```
LDA#$12orLDA#$12
TFR A,DP    EXG A,DP
```

Table 1: 6809 Indexed and Indirect Addressing Modes

Type	Form	Non-Indirect		Cycles + +	Bytes + +	Indirect		Cycles + +	Bytes + +
		Assembler Form	Post-Byte Dg-code			Assembler Form	Post-Byte Dg-code		
Constant Offset from R	No Offset	.R	1RR00100	0	0	(.R)	1RR10100	3	0
	5-Bit Offset	n,R	0RRannnn	1	0		Defaults to 8-bit		
	8-Bit Offset	nn,R	1RR01000	1	1	(nn,R)	1RR10000	4	1
	16-Bit Offset	mmnn,R	1RR01001	4	2	(mmnn,R)	1RR11001	7	2
Accumulator Offset from R	A — Register Offset	A,R	1RR00110	1	0	(A,R)	1RR10110	4	0
	B — Register Offset	B,R	1RR00101	1	0	(B,R)	1RR10101	4	0
	D — Register Offset	D,R	1RR01011	4	0	(D,R)	1RR11011	7	0
Auto Increment/Decrement R	Increment by 1	.R+	1RR00000	2	0		Not allowed		
	Increment by 2	.R++	1RR00001	3	0	(.R++)	1RR10001	6	0
	Decrement by 1	.-R	1RR00010	2	0		Not allowed		
	Decrement by 2	.-R	1RR00011	3	0	(.-R)	1RR10011	6	0
Constant Offset from PC	8-Bit Offset	label, PCR	1XX01100	1	1	(label, PCR)	1XX11100	4	1
	16-Bit Offset	label, PCR	1XX01101	5	2	(label, PCR)	1XX11101	8	2
Extended Indirect	16-Bit Address	—	—	—	—	(mmnn)	10011111	5	2

R = X, Y, U, or S
XX = Don't Care

RR 00 = X 10 = U
01 = Y 11 = S



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THE CORRECT DESTINATION

Relative Addressing: This is used with the branch instructions. The operand is a signed number (8-bits with the short branch instructions BRA, BRN, BHL, etc. and 16-bits with the corresponding long branch instructions LBRA, LBRN, LBHL, etc) which is added to the current address to give the destination address when the branch takes place.

With a short branch the destination must be between -128 and +127 bytes from the address immediately following the branch instruction, but the destination of a long branch instruction may be anywhere in the 64k address space.

Indexed and Indirect Addressing Modes: The 6809 has an extensive set of indexed and indirect addressing modes, summarised in table 1. Instead of giving a full explanation and examples for each one I will just give a general outline here, and we will look at these addressing modes in detail later when we come to real example programs.

The machine code form of indexed and indirect instructions consists of the opcode, followed by a post-byte (which specifies the actual addressing mode), and in some cases there is one or two additional bytes which contain a constant offset.

In assembly language the general form of an indexed operand is Q,R where R is a register name and Q is a specification for an offset. The effective address is calculated by adding the offset to the contents of the base register R.

In all cases the offset is taken as a two's complement signed binary number. Where an 8-bit operand is required the memory location indicated by the effective address is used; where a 16-bit operand is required, two consecutive memory locations are used, the first being the one indicated by the effective address.

With indirect addressing there is a further step in the calculation of the effective address. The offset is added to the contents of the base register, and the result of this addition is taken as the address of the first of two bytes whose contents form the effective address.

LESS USEFUL CONCEPTS...

Z80 Addressing Modes

The concept of addressing modes is less useful on the Z80 than it is on the 6802 and 6809. Although the Z80 has some addressing modes with fairly general application, there are several forms of operand specification which can be used with only a small group of opcodes.

There is no generally accepted terminology or grouping and you will find different books using different names for the Z80 addressing modes and grouping the addressing modes differently.

Many Z80 instructions take an operand of the form destination, source and we have seen examples of this in earlier parts of the series.

The index registers IX and IY can be used in instructions which take this form of operand. In general, we can use an

index register wherever we can use the register pair HL, although there are some instructions which allow HL in the operand but do not have a corresponding form with IX and IY.

Where HL appears in the operand the corresponding index register instructions replace HL by IX or IY, for example, instead of LD HL, 1000H we can write LD IX, 1000H and LD IY, 1000H or instead of LD HL, (1234H) we can write LD IX, (1234H) and LD IY, (1234H).

Where (HL) appears in the operand the corresponding index register instructions have (IX+ displacement) or (IY+ displacement). Instead of using the register contents as an address, a constant is added first and the result used as an address.

For example, if IX contained 1000H, the instruction LD A, (IX+10H) would lead the accumulator with the contents of memory location 1010H.

EXCEPTION TO THE RULES

There is one exception to the rule that (IX+displacement) or (IY+displacement) corresponds to (HL), and this is with the jump instruction. Corresponding with JP (HL) we have JP (IX and IY).

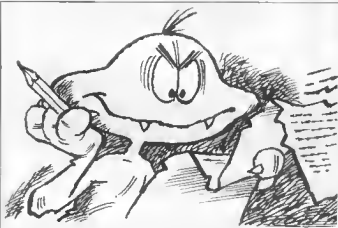
There are some exceptions to the destination, source form of operand. For example we have ADD A, data; ADD A, register; ADD A, (HL); ADD A, (IX+d); ADD A, (IY+d), but SUB data SUB register; SUB (HL); SUB (IX+d); SUB (IY+d).

The assembly language requires that we specify A as the destination with an ADD instruction because we can use ADD with other registers ADD HL, register pair; ADD IX, register pair; ADD IY, register pair; while all forms of SUB use A as the destination.

If you have any problems relating to Ted Ball's Machine Code articles, questions about machine code programming or assembly languages, then please don't hesitate to drop us a line and we'll pass on your questions to our expert.

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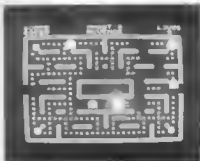


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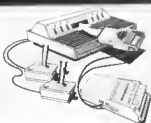
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